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QUEENSLAND AGRICULTURAL JOURNAL

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PART I.

Event and Comment.

The Current Issue.

Readers will find the July Journal a useful number. Mr. Graham discusses some faults in butter, and his paper will have a wide interest for all engaged in butter production and manufacture. The tabulated awards in connection with the recent exhibition of dairy products, organised by the Queensland Butter and Cheese Factory Managers' Association, are useful and worth careful study. A Ministerial statement on the cotton industry removes many misconceptions that have been generated in the heat of current controversy. Results of tests for the purpose of determining the suitability of the Australian bushel case for packing oranges are set out. Mr. Shelton's notes on pig raising are, as usual, full of interest. Mr. Girault's supplementary notes on the Orange Bug add further value to this month's issue.

Agriculture and the Scientist.

Modern ideas and the trend of modern opinion in relation to agricultural education are strongly stated by a writer, an eminent scientist, in the "International Review of the Science and Practice of Agriculture." Agricultural education, he says, is faced with a serious crisis. As at present organised it is accused of being too theoretical, so that the student is not kept sufficiently in touch with the realities of practice. The history of the great discoveries, which in the last fifty years have transformed the art of soil cultivation into a complex and scientific industry, shows at each step the direct influence of pure science. "Everywhere and always," the writer continues, "pure science constitutes the active source from which, although often it may be by long and devious paths, true practical progress is surely derived. . . . In any attempt to determine the part played by teaching institutions and research in furthering the great work of the scientific reform of agriculture, it must be admitted that the aim should be pre-eminently to ensure the necessary liaison between pure theoretical science and practice, and to select from among the original abstract theories of laboratory experts the ideas that lend themselves to practical application, testing and adapting them to the requirements of agricultural technique, and finally, and above all, to arrange their general diffusion. . . . The need to-day is rather for true scientists competent to achieve success in original research. . . . A high level of preliminary scientific education, a far-reaching general professional training and a moderate degree of specialisation—such should be the qualifications which the agricultural scientist of to-morrow should be expected

to supply. . . . Some countries have realised that the day of a relatively easy victory and diffusion of knowledge is ended, and that for wresting from nature the secret of new wealth, and for realising the imperious claim of impoverished humanity in this troubled post-war period, for an increase in the productivity of the soil, an ever-increasingly urgent appeal must be made to science as the only true generating force of progress."

The Present Condition of Agriculture.

In the United States a Federal Commission has been inquiring generally into the present condition of the agricultural industry. The subjects of inquiry included the difference between the prices of agricultural products paid to the producer and the ultimate cost to the consumer; the comparative condition of industries other than agriculture; the relation of prices of commodities other than agricultural products to such products; the banking and financial resources and credits of the country, especially as affecting agricultural credits; and marketing and transportation facilities. The Commission undertook to measure the farmers' economical position by the purchasing power of the farmers' dollar, the absolute prices of farm products as compared with the prices of other groups of commodities, the quantity production of agriculture as compared with that of other industries, and the income or reward for capital invested and labour employed in agriculture as compared with that in other industries. As a result of its inquiries the Commission, among other things, recommended: (1) An adaptation of the banking system to the peculiar credit needs of rural industry; (2) reduction of freight rates on farm products; (3) adoption of accurate, uniform, and practical grades and standards for agricultural produce; (4) improved record keeping of the cost of production of farm products on the basis of the farm plant unit; (5) practical and scientific investigations of rural problems; (6) improved handling and distributing facilities; (7) better roads to local markets and joint facilities at terminals connecting rail, water, and motor transport systems; and (8) a greater effort to improve rural community life. To sum up, the Commission was convinced that the renewal of conditions of confidence and of industrial, as well as agricultural, prosperity is dependent upon a readjustment of prices for commodities, to the end that prices received for them will represent a fair division of the economic rewards of industry, risk, management, and investment of capital.

Film Propaganda.

In the course of the month the Minister (Hon. W. N. Gillies) called timely attention to the unwisdom of releasing cinema films for exhibition in England which convey a false idea of Australian rural life. Australia is a country that can stand the truth, and pictured exaggerations of conditions here do far more harm than good. By keeping to the realities of rural life in efforts to impress prospective settlers from overseas, Australian immigration shall not suffer, rather the reverse; for when actual conditions are known, people worth while are more likely to be attracted by the opportunities offered in a land where skill, will, and character find fitting scope and ample reward. The Department of Agriculture, appreciating the good business in the faithful filming of our rural industries, has already completed some very fine motion pictures of our great wool and sugar industries for exhibition abroad. These films are absolutely true to life and show actual conditions as they exist on our Western pastoral areas and tropical Coastal region. Films of other phases of Queensland country life are in course of preparation. After all, practical people looking within the Empire for fields for the settlement of Britain's overflow population want only the facts of country conditions in Australia. And the facts, if known, as they should be, will appeal most strongly to virile migrants in search of wider fields of opportunity.

The Cactus Curse.

An Order in Council has just been promulgated placing the whole of our prickly-pear infested land under the jurisdiction of the Prickly Pear Land Commission. The Commission is certain that the spread of the pear can be effectively checked. By concentrating the control of all pear land under one authority, uniformity of action and consistency of policy will naturally follow. This was really the fundamental idea in the establishment of the Commission. For the present, operations will be centred on scattered pear areas. By the use of effective poisons these areas will, it is expected, be soon cleared. Dense pear for the time being will be subjected to biological experiments. In this connection the Commission hopes to be shortly in a position to facilitate the free distribution of cochineal insects, and is now engaged in defining buffer areas with the object of preventing the spread of the cactus beyond its present limits.

SOME FAULTS IN BUTTER.

Paper read by Mr. E. Graham, Director of Dairying, at the Annual Conference of the Queensland Butter and Cheese Factory Managers' Association, at Brisbane, on the 26th June, 1924.

An occasion such as this, when there are present those charged with the responsibility of the manufacture of butter or cheese in the dairy factories, might be accepted as opportune to make reference to the predominant faults which, by their presence, have affected the quality and appearance of dairy produce manufactured during the season which is about to terminate, also to foreshadow a line of action which will make for the better conduct of the industry during the ensuing year.

The manufacturing interests of the dairy industry, in so far as the representation at this Conference is concerned, are divisible under two general headings—namely, (a) those engaged in the manufacture of butter and (b) those engaged in the manufacture of cheese.

It is proposed to make reference, firstly, to faults associated with butter.

Wood Taint.

There were two defects which were present in butter to an abnormal extent during the season. The defects were wood taint and mould or yeast growths. Upon an investigation being made into the matter of wood taint it was revealed that the trouble was wide-spread and not restricted to any particular factory or district, or to supplies of box timber drawn from an isolated sawmill. It was found also that unseasoned box timber whether of hoop-pine (*Araucaria Cunninghamii*) or Bunya pine (*Araucaria Bidwelli*) was capable of conveying a tainted flavour to butter. The defect was more prevalent in cases where the latter kind of timber was used.

Upon this stage being reached the Department of Agriculture placed itself in communication with sawmill proprietors, either through the channels of their association or by writing to a number of them direct, emphasising the urgent necessity to take such action at the sawmills as would ensure that only thoroughly seasoned pine timber would be supplied for the making of butter boxes.

In the replies received from proprietors of timber mills there is expressed a willingness to give compliance to the request made to them. A number of millowners, however, stressed the point that it would be of material assistance if factories desiring to secure box timber would place their orders for "forward" delivery, rather than for immediate supply, thereby allowing timber mills increased opportunity to carry out the seasoning of the timber.

This appears to be a reasonable, business-like proposal, and one well worthy of consideration by manufacturers of butter, it being virtually a consequential result arising out of the request made for the supply of well-seasoned timber.

Customarily the supplies of butter box timber are consigned from the timber mills to the butter factories in shooks, and it is questionable whether partially seasoned timber dries out satisfactorily if stored in this manner in the box rooms at factories. This gives rise to the query whether it would not be in the interests of the industry for factories to construct, as an additional safeguard, some class of rack which would permit of the separate portions of the box timbers being dried thoroughly before the boxes are made up.

The application of paraffine to the interior surfaces of the boxes has been tried as a means to overcome the wood taint flavour in butter, but the results have been not more than partially satisfactory.

In practice the appliance or machine designed for the purpose of paraffining the box timber fails to do the work perfectly, and the indications are that a satisfactory method of applying paraffine by means of a machine will not be forthcoming unless there is conjoined with the process a provision to preheat the surface of the pine timber to which it is intended to apply the paraffine.

The application, per medium of any machine available, of a film of liquified paraffine wax to the unheated surface of the timber does not provide a satisfactory solution of the wood taint problem, chiefly because the veneer of paraffine is not

firmly attached to the surface of the timber and fails to furnish adequate protection to the butter when placed in the package.

As the outcome of the investigation into the matter of wood taint by the dairy staff of the Department of Agriculture, it was ascertained that the pine timbers when moistened gave off a more pronounced and copious odour than that noticeable upon similar timber when in a dry condition. This led to the action taken by the Department in advising all butter factories to resort to dry papering of butter boxes as a means of combating "wood taint" flavour. Although the adoption of this method of papering has not entirely eliminated the trouble, it has been efficacious in bringing about a considerable reduction of the fault, and has removed the difficulty when properly seasoned and normal timber is used in butter boxes. It must be remembered, however, that the dry paper method is robbed of its efficacy if butter with free moisture is packed in boxes made of Queensland pine, because the free moisture exuding from this class of butter quickly saturates the butter paper and in turn dampens the timber of which the box is made, thereby defeating the object for which the dry paper is employed.

It has been found also that there is a class of pine timber known as black heart or sinker pine, which, under no circumstances (whether seasoned or otherwise), is suitable for butter box purposes. (Specimens of this class of pine timber were exhibited at a later stage.—ED.)

The comparatively higher specific gravity or increased weight of sinker pine, together with the marked discoloration of this class of timber, may be relied upon as a guidance in the selection of timber for butter boxes, and the sense of smell may be availed of with advantage in discriminating between timbers which are suitable or otherwise when boxes are being made up from the stocks of timber ordinarily held at the factory.

Upon a careful examination being made of a box of butter affected by wood taint it is found that usually the wood taint flavour does not penetrate to any great depth into the block of butter packed in the box, but the degree of penetration is governed to an extent both by the firmness of the butter at the time it is packed and the temperature at which the butter is held subsequently. In other words, the solidity of the butter is a factor in retarding the penetrative influence of wood taint, but the association of wood taint flavour with the narrowest selvedge of butter is highly objectionable to traders in butter. It especially affects those engaged in the business of cutting bulk butters into one pound and half-pound prints, because only the few prints cut from the interior of the cube of "wood-tainted" butter are free from the fault.

Experiments With Case Timber.

For experimental purposes box timber, which by its appearance and characteristic odour was considered likely to produce wood taint flavour in butter, was selected and made up into boxes.

Later, butter churned from a common supply of cream was packed in these boxes after each box had been treated or papered in a different manner.

The butters in the several boxes were examined and placed under observation in cold store. At the first examination of the butters it was found that the butter packed in the box which had been lined with wet paper was manifestly affected with wood taint. The butter packed in the box which had been paraffined and lined with wet paper was more affected with wood taint than was the butter contained in a box which had been lined with dry paper.

The butters were re-examined about a fortnight later and the findings concerning the order of merit of the several boxes of butter were similar to those obtaining at the outset.

After the lapse of some weeks the butters were again examined, and it was found that the butter packed in the box lined with dry paper had held best in quality. The characteristic wood taint flavour at this stage was not nearly so pronounced in any of the butters as it was at the time of the primary examination. This happening may be attributed to changes taking place in the butters while they were held in cold storage, and due principally to the development of cold store flavours which had advanced sufficiently to overshadow the wood taint flavour originally contained in the butters. This result is of interest as it furnishes a reason why practically no reference has been made to the presence of wood taint in butters exported to oversea markets from Queensland.

In the investigation of the matter of wood taint, the result of chemical analysis of the affected pine timber furnished little information of value for guidance in dealing with the problem.

Thoroughly Seasoned Pine Desired.

In view of the seriousness of wood taint affecting as it does two of our important industries, viz., the dairying and timber industries, it becomes incumbent alike upon managers of butter factories or timber mills to leave no stone unturned to stamp out the trouble. The key of the position from the timber-millers' standpoint is to supply thoroughly seasoned pine timber and to exclude sinker pine entirely from timber intended for butter box purposes. The factory manager must cause all box timber to be closely examined before use, to discard all unseasoned and unsuitable timber, and to adhere strictly to "dry" paper for lining butter boxes until such time as there is available a more efficacious and practicable means of combating the wood taint difficulty.

Conclusions Summarised.

In the light of our present knowledge of the matter of wood taint the following conclusions have been arrived at:—

That wood taint flavour in butter was present to an abnormal degree during the season.

That butter boxes made from unseasoned pine timber are unsatisfactory for use as containers of butter.

That there is a particular class of pine timber known as "sinker" or "black heart," which is totally unsuitable for butter box purposes.

That the application of paraffine wax to butter box timber is not performed with entire satisfaction by any machine available at present.

That there is little or no risk of wood taint flavour occurring in butters packed in boxes made of thoroughly seasoned pine, and lined with "dry" paper.

That wood taint flavour is not readily discernible in butter which has been held for some weeks at a low temperature.

Mould Growths.

I wish now to draw attention to mould growths which appear upon the surface of the butter, or the interior of the butter box, or upon the paper used for lining the box. This fault in butter has occurred with more than ordinary frequency during the season.

I will first touch upon the common fields of mould production, and afterwards proceed to discuss the more probable and possible sources of contamination of the cream or butter. Moulds grow upon a wide range of substances, such as moist or decaying wood or other vegetable matter, some foodstuffs, leather, &c., but the moulds infecting cream or butter held at the factory owe their origin principally to the former source.

In addition to a suitable food supply, moulds require moisture and shaded or dark surroundings, also oxygen or gases for their development. The latter requirement affords an explanation of the reason that moulds are primarily noticeable attached to the outer surface of butter, or the paper used as a covering for it. Mould-producing organisms are present in the atmosphere.

In practice it may happen that mould-infested cream is delivered to the factory, although no trace of mould growth is discernible upon the surface of the cream. When cream is efficiently pasteurised the living mould organisms are destroyed, and the likelihood of any spore subsequently developing and causing trouble in the butter is remote under factory working conditions. Obviously, a great deal depends upon the efficiency with which the process of pasteurisation is carried out.

At a later stage fuller reference will be made to the importance of efficient pasteurisation and its effects upon mould organisms, consequently we may temporarily dismiss it from consideration.

Assuming that by efficient pasteurisation the cream has been rendered practically free from mould forms of germ life, it remains necessary to protect the pasteurised cream from reinfection, while it is held in the factory, preparatory to churning it into butter.

Having previously set down that wood is one of the principal fields for productions of mould found in factory butter, it is interesting to note how closely the pasteurised cream and the butter are brought into contact with this highly probable source of infection.

Customarily, the cream after pasteurisation is held in a vat which stands in a room with walls and ceilings made of wood. From the vat the cream passes into a churn which is constructed principally of wood. Usually the walls and ceilings of the churning rooms are of wood, and the butter churned from the cream is packed into a wooden box. Additionally, a number of factories burn wood fuel, and frequently many cords of firewood are stacked in close proximity to the factory building, while stocks of butter box timber are common in all factories.

The cream supply as a result of pasteurisation is rendered in a condition highly susceptible to reinfection from external sources, chiefly because the lactic organisms, which ordinarily afford a natural protection to the quality of the cream, have been destroyed by the heat applied in pasteurisation. Obviously, there are manifold sources from which cream or butter might become infected with mould organisms, and the proper course is to take such action as will reduce the avenues of infection to a minimum.

It is manifestly clear that factories constructed of reinforced concrete are infinitely superior to those of wood. Experience has shown that the enamel paints, on account of their hard surface, have material advantages over the ordinary kinds of paints used as a covering.

The working rooms and factory should be painted throughout yearly at least. Frequent washings or spraying of the walls with a solution of formalin and water are essential. Unless extreme care is exercised in cleansing, the churn may become a fruitful source of infection. The churn needs to be treated frequently with a solution of hypochlorite of sodium or with lime water. It is possible also to close the churn and disinfect it with formic acid. Sole reliance must not be placed upon a solution of boiling water and sal soda for the purpose of thoroughly cleansing a combined churn and worker.

Moulds are frequently associated with cream pumps, and piping used for the conveyance of cream from place to place in the factory, and for this reason the pumping of cream, or the passing of it through closed pipes after pasteurisation, is an unsound practice.

The box timber constitutes a probable source of mould infection.

Mould growths are frequently attached to the surface of unseasoned box timber, and box timber which has been moistened during transit from the sawmill to the factory, or at the factory, is very liable to cause trouble. Too great care cannot be given to the protection of box timber from moisture. Boxes properly paraffined are practically beyond danger. Any box timber showing the presence of mould should not be used for butter box purposes, unless it is first boiled in a solution of formalin and water and then thoroughly dried.

Butter parchment paper and even salt may be the means of infecting butter with mould organism, but usually the trouble in these cases arises from the exposure of the parchment paper or salt at the factory. The remedy is to keep these commodities protected. By boiling the wrapping paper or submerging it into a solution of boric acid and water, the paper may be rendered free from living mould organism; but, because of the necessity of using "dry paper" on account of wood taint influences, this treatment is somewhat impracticable.

The neglected wood stack provides a prolific source for seeding the atmosphere contiguous to the factory with mould-producing organism. It is the detached bark and small pieces of timber which come in contact with the moist earth that constitute

the greatest danger. The bark and fragments of timber should be raked up periodically and destroyed by fire. It is advisable also to arrange that the wood stack is so situated that the prevailing winds do not pass across it to the factory. The cream room particularly requires safeguarding in this direction.

Having touched upon the principal sources of mould infection, and the remedies which may be employed to obviate the infection of cream or butter at the factory, there remains as a check to the degree of efficiency of pasteurisation a definite test by which the thoroughness of this work may be gauged—that is, by the exposure of plates within the confines of the factory in order that the purity or otherwise of the atmosphere may be determined. This test is conclusive and reliable, and arrangements have been made for the periodical examination of the air circulating in factories by this means. I believe the information brought to light in this way will be of considerable benefit and assistance to those engaged in the manufacture of butter.

Thom and Shaw carried out a complete investigation into mouldiness in butter, and arrived at the conclusion that mould in butter usually takes three forms:—

- (1) Orange yellow (red) areas with a submerged growth of *Mycelium*, which are produced by *Oidium Lactis*.
- (2) Smudged or dirty green areas either entirely submerged or with some surface growth; these are produced by species *Alternaria* and *Cladosporium*.
- (3) Green surface areas which are produced by *Penicilium*, or more rarely *Aspergillus*, either upon butter causing decomposition, or upon the container or wrapper, injuring the appearance of the butter for market purposes.

It is significant to note that the classes of mould growth set out in Nos. 1 and 2 above do not develop in butters containing $2\frac{1}{2}$ per cent. of salt.

O. F. Hunziker summarised the efficiency of pasteurisation in destroying yeasts and moulds in butter. He showed that the efficiency of pasteurisation in killing yeasts and moulds was 78 per cent. when a temperature exposure of 165 Fahrenheit for 30 seconds was used; while at 185 Fahrenheit for 30 seconds or 145 Fahrenheit for 30 minutes (the latter two being the methods ordinarily adopted in butter factories) the process was 99.9 per cent. efficiency.

It will be seen that, even when all channels for the reinfection of pasteurised cream are closed, there remains a danger of mould growth taking place upon the butter unless pasteurisation of the cream has been efficiently performed. Under the ordinary working conditions in factories, it is customary to accept thermometer readings made while the cream is passing from the pasteuriser as an index as to whether the cream is pasteurised efficiently or otherwise.

For several reasons this method is unsatisfactory, and with the view of enabling those in charge of the operations of the factory to acquire a more reliable means of checking the efficiency of the pasteuriser, it has been arranged that a demonstration will be given on what is known as the "Storch" test.

Personally, I am of the opinion that the general adoption of this test by factories would be decidedly advantageous, and if the majority of those present share this opinion the Storch test will be demonstrated later by the Instructors in Dairying at the dairy factories throughout the State. Dairy scientists and writers of text-books upon dairying matters urge the necessity for efficient pasteurisation; factory managers are advocates for it, but with us there has been lacking a check test which could be applied for the purpose of indicating whether the pasteurisation of milk or cream has been performed efficiently or otherwise. I believe the Storch test in the present, or in some slightly modified form, will supply what the industry is lacking in this direction.

BUTTER AND CHEESE.**QUEENSLAND FACTORIES EXHIBITION.**

The annual exhibition of dairy products organised by the Queensland Butter and Cheese Factory Managers' Association was opened in Brisbane on 25th June. Mr. E. Graham, Director of Dairying, acted as judge. Following are the details of awards:—

BUTTER.**EIGHT WEEKS' STORAGE.**

	Flavour.	Texture.	Salting.	Colour.	Finish.	Packing.	Total.
Caboolture Co-operative Co., Caboolture	54	19 $\frac{3}{4}$	5	5	5	5	93 $\frac{3}{4}$
Queensland Farmers' Co-operative Co., Grantham	53 $\frac{3}{4}$	19 $\frac{3}{4}$	5	5	5	5	93 $\frac{1}{4}$
Logan and Albert Dairy Co. .. .	53 $\frac{1}{2}$	19 $\frac{3}{4}$	5	5	5	5	93 $\frac{1}{4}$
Queensland Farmers' Co-operative Co., Boonah	53	19 $\frac{1}{2}$	5	5	5	5	92 $\frac{3}{4}$
Warwick Butter and Dairy Co., Goondiwindi	52 $\frac{1}{2}$	19 $\frac{1}{2}$	5	5	4 $\frac{3}{4}$	5	91 $\frac{3}{4}$
Murgon Co-operative Dairy Co. .. .	52 $\frac{3}{4}$	19 $\frac{3}{4}$	5	5	5	5	92 $\frac{1}{2}$
Warwick Butter and Dairy Co., Allora	53	19 $\frac{1}{2}$	5	5	5	5	92 $\frac{1}{2}$
Downs Co-operative Dairy Co., Natcha	52	19 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	5	5	90 $\frac{1}{2}$
Downs Co-operative Dairy Co., Crow's Nest	53	19 $\frac{3}{4}$	5	5	5	5	92 $\frac{3}{4}$
Caboolture Co-operative Co., Eumundi	52	19 $\frac{1}{2}$	4 $\frac{3}{4}$	5	5	5	91 $\frac{1}{4}$
Queensland Farmers' Co-operative Co., Booval	52 $\frac{1}{2}$	19 $\frac{1}{2}$	5	5	5	5	92
Downs Co-operative Dairy Co., Clifton	49	19	4	5	4 $\frac{1}{2}$	5	86 $\frac{1}{2}$
Maryborough Co-operative Dairy Co., Kingaroy	52 $\frac{1}{2}$	19 $\frac{1}{2}$	5	5	5	5	92
Downs Co-operative Dairy Co., Brook street	52	19 $\frac{3}{4}$	5	5	5	5	91 $\frac{3}{4}$
Queensland Farmers' Co-operative Co., Laidley	51	19 $\frac{1}{2}$	5	5	5	5	90 $\frac{1}{2}$
Oakey Co-operative Dairy Co. .. .	52 $\frac{1}{2}$	19 $\frac{1}{2}$	5	5	4 $\frac{1}{2}$	5	91 $\frac{1}{2}$
Port Curtis Co-operative Dairy Co. .. .	52 $\frac{1}{2}$	19 $\frac{1}{2}$	5	5	4 $\frac{1}{2}$	5	91 $\frac{1}{2}$
Nanango Co-operative Dairy Co. .. .	51	19 $\frac{1}{2}$	5	5	5	5	90 $\frac{1}{2}$
Warwick Butter and Dairy Co., Texas	50	19 $\frac{1}{2}$	5	5	4 $\frac{1}{2}$	5	89

THIRTY DAYS' STORAGE.

	Flavour.	Texture.	Salting.	Colour.	Finish.	Packing.	Total.
Queensland Farmers' Co-operative Co., Booval	54 $\frac{1}{4}$	19 $\frac{3}{4}$	5	5	5	5	94
Warwick Butter and Dairy Co., Texas	54	19 $\frac{3}{4}$	5	5	5	5	93 $\frac{3}{4}$
Oakey Co-operative Co.	53 $\frac{3}{4}$	19 $\frac{3}{4}$	5	5	5	5	93 $\frac{1}{2}$
Downs Co-operative Dairy Co., Natcha	52	19 $\frac{1}{2}$	5	5	4 $\frac{1}{2}$	5	91 $\frac{1}{4}$
Terror's Creek Co-operative Dairy Co.	53	19 $\frac{3}{4}$	5	5	4 $\frac{3}{4}$	5	92 $\frac{1}{2}$
Queensland Farmers' Co-operative Co., Laidley	53	19 $\frac{3}{4}$	4 $\frac{1}{2}$	5	4 $\frac{3}{4}$	5	92
Port Curtis Co-operative Dairy Co. .. .	51	19 $\frac{1}{2}$	4 $\frac{1}{2}$	5	4 $\frac{1}{2}$	5	90

THIRTY DAYS' STORAGE- *continued.*

	Flavour.	Texture.	Salting.	Colour.	Finish.	Packing.	Total.
Maryborough Co-operative Dairy Co., Kingaroy	53 $\frac{1}{2}$	19 $\frac{1}{2}$	5	5	5	5	93
Logan and Albert Dairy Co. ..	53 $\frac{1}{2}$	19 $\frac{1}{2}$	5	5	4 $\frac{3}{4}$	5	92 $\frac{3}{4}$
Downs Co-operative Dairy Co., Brook street	53 $\frac{1}{2}$	19 $\frac{1}{2}$	5	5	5	5	93
Gayndah Co-operative Dairy Co. ..	52	19 $\frac{1}{2}$	4 $\frac{1}{2}$	5	5	5	91
Queensland Farmers' Co-operative Co., Grantham	53	19 $\frac{3}{4}$	5	5	5	5	92 $\frac{3}{4}$
Esk Co-operative Dairy Co. ..	52 $\frac{1}{2}$	19 $\frac{3}{4}$	5	5	5	5	92 $\frac{1}{4}$
Caboolture Co-operative Co., Eumundi	52	19 $\frac{1}{2}$	5	5	5	4 $\frac{1}{2}$	91
Warwick Butter and Dairy Co., Goondiwindi	51	19 $\frac{1}{2}$	5	5	5	5	90 $\frac{1}{2}$
Warwick Butter and Dairy Co., Allora	52 $\frac{1}{2}$	19 $\frac{3}{4}$	5	5	5	5	92 $\frac{1}{4}$
Murgon Co-operative Dairy Co. ..	52 $\frac{3}{4}$	19 $\frac{1}{2}$	5	5	5	5	92 $\frac{1}{4}$
Caboolture Co-operative Co., Caboolture	52 $\frac{1}{2}$	19 $\frac{1}{2}$	4 $\frac{1}{2}$	5	5	5	91 $\frac{1}{2}$
Killarney Dairy Co.	51	19 $\frac{3}{4}$	5	5	4	5	89 $\frac{3}{4}$
Nanango Co-operative Dairy Co. ..	52 $\frac{1}{2}$	19 $\frac{1}{4}$	5	5	5	5	91 $\frac{3}{4}$
Queensland Farmers' Co-operative Co., Boonah	51	19 $\frac{1}{2}$	5	5	5	5	90 $\frac{1}{2}$
Downs Co-operative Dairy Co., Crow's Nest	52	19 $\frac{1}{2}$	5	5	5	5	91 $\frac{1}{2}$

FRESH.

	Flavour.	Texture.	Salting.	Colour.	Finish.	Packing.	Total.
Possible Points.	60	20	5	5	5	5	100
Queensland Farmers' Co-operative Co., Booval	55	19 $\frac{3}{4}$	5	5	5	5	94 $\frac{3}{4}$
Queensland Farmers' Co-operative Co., Grantham	54 $\frac{1}{2}$	19 $\frac{3}{4}$	5	5	5	5	94 $\frac{1}{4}$
Kingston Co-operative Dairy Co. ..	54	19 $\frac{3}{4}$	5	5	5	5	93 $\frac{3}{4}$
Oakey Co-operative Dairy Co. ..	53	19 $\frac{1}{2}$	5	5	4 $\frac{3}{4}$	5	92 $\frac{1}{4}$
Caboolture Co-operative Co., Caboolture	52	19 $\frac{1}{2}$	5	5	5	5	91 $\frac{1}{2}$
Queensland Farmers' Co-operative Co., Laidley	53 $\frac{1}{2}$	19 $\frac{1}{2}$	5	5	5	5	93
Nanango Co-operative Dairy Co.	52 $\frac{1}{2}$	19	5	5	5	5	91 $\frac{1}{2}$
Warwick Butter and Dairy Co., Allora	51	19 $\frac{1}{2}$	5	5	4 $\frac{1}{2}$	5	90
Caboolture Co-operative Co., Eumundi	52	19 $\frac{1}{2}$	4 $\frac{3}{4}$	5	5	5	91 $\frac{1}{4}$
Warwick Butter and Dairy Co., Goondiwindi	51	19 $\frac{1}{2}$	5	4 $\frac{3}{4}$	5	5	90 $\frac{1}{4}$
Murgon Co-operative Dairy Co. ..	51 $\frac{1}{2}$	19	5	5	4 $\frac{3}{4}$	5	90 $\frac{1}{4}$
Downs Co-operative Dairy Co., Crow's Nest	50	19	5	5	4 $\frac{3}{4}$	5	88 $\frac{3}{4}$
Caboolture Co-operative Co., Pomona	52	19 $\frac{1}{2}$	5	5	4 $\frac{3}{4}$	5	90 $\frac{1}{4}$
Maryborough Co-operative Dairy Co., Kingaroy	51 $\frac{1}{2}$	19	5	5	4 $\frac{3}{4}$	5	90 $\frac{1}{4}$

FRESH—continued.

	Flavour.	Texture.	Salting.	Co.our.	Finish.	Packing.	Total.
Possible Points.	60	20	5	5	5	5	100
Esk Co-operative Dairy Co. ..	52	19	5	5	4 $\frac{3}{4}$	5	90 $\frac{3}{4}$
Downs Co-operative Dairy Co., Brook street	53	19 $\frac{1}{2}$	5	5	5	5	92 $\frac{1}{2}$
Warwick Butter and Dairy Co., Texas	50	19 $\frac{1}{2}$	5	4 $\frac{3}{4}$	4 $\frac{3}{4}$	5	89
Gayndah Co-operative Dairy Co. ..	52	19 $\frac{1}{2}$	5	5	5	5	91 $\frac{1}{2}$
Downs Co-operative Dairy Co., Clif- ton	51 $\frac{1}{2}$	19 $\frac{1}{2}$	5	4 $\frac{1}{2}$	5	5	90 $\frac{1}{2}$
Killarney Dairy Co.	51	19 $\frac{1}{2}$	5	5	4	5	89 $\frac{1}{2}$
Queensland Farmers' Co-operative Co., Boonah	53	19 $\frac{3}{4}$	5	5	5	5	92 $\frac{3}{4}$
Logan and Albert Co-operative Dairy Co.	52	19	5	5	4 $\frac{1}{2}$	5	90 $\frac{1}{2}$

SELECTED BOX—EXPORT OR SALE.

Nanango Co-operative Dairy Co.	1
Queensland Farmers' Co-operative Co., Grantham	2
Caboolture Co-operative Co. and South Burnett Co-operative Co., equal ..	3

CHEESE.

TWO EXPORTS, PASTEURISED.

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
Pittsworth Co-operative Dairy Co.	46	25	14	9 $\frac{1}{2}$	94 $\frac{1}{2}$
Mount Tyson Co-operative Dairy Co.	45	24 $\frac{1}{2}$	15	9 $\frac{1}{2}$	94
Pittsworth Co-operative Dairy Co.	44	24 $\frac{1}{2}$	14	10	92 $\frac{1}{2}$
Southbrook Dairy Co.	44	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9	92
Warwick Butter and Dairy Co., L.J.S.	43 $\frac{1}{2}$	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{1}{2}$	92
Biddeston Co-operative Dairy Co.	42	24	14	9	89

TWO EXPORT, UNPASTEURISED.

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible Points	50	25	15	10	100
*Mount Tyson Dairy Co.	45	24 $\frac{3}{4}$	14 $\frac{3}{4}$	10	94 $\frac{1}{4}$
Downs Co-operative Dairy Co., Hodgson Vale ..	43	25	14 $\frac{3}{4}$	10	92 $\frac{3}{4}$
Warwick Butter and Dairy Co.	43	24 $\frac{3}{4}$	14 $\frac{3}{4}$	10	92 $\frac{1}{4}$
Downs Co-operative Dairy Co., Westbrook ..	42	24 $\frac{1}{2}$	14 $\frac{3}{4}$	10	91 $\frac{1}{4}$
Mount Sibley Dairy Co., Greenmount ..	42	24 $\frac{1}{2}$	14 $\frac{3}{4}$	9 $\frac{3}{4}$	91
Warwick Butter and Dairy Co., Elbow Valley ..	41 $\frac{1}{2}$	24 $\frac{3}{4}$	14 $\frac{3}{4}$	10	91
Warwick Butter and Dairy Co., Greymare ..	41 $\frac{1}{2}$	24	14 $\frac{3}{4}$	10	90 $\frac{1}{4}$
Pittsworth Dairy Co., No. 4 factory ..	40	24 $\frac{1}{2}$	14	10	88 $\frac{1}{2}$
Downs Co-operative Dairy Co., Gowrie Junction	38	24 $\frac{1}{2}$	14 $\frac{3}{4}$	10	87 $\frac{1}{4}$
Warwick Butter and Dairy Co., Bony Mountains	41	24	14 $\frac{3}{4}$	10	89 $\frac{1}{2}$
Kooroongarra Dairy Co.	39	24 $\frac{1}{2}$	14 $\frac{1}{2}$	10	87 $\frac{3}{4}$
Downs Co-operative Dairy Co., Koondai-i ..	41	25	14 $\frac{1}{2}$	10	90 $\frac{3}{4}$
Warwick Butter and Dairy Co., Pratten ..	38	24 $\frac{1}{2}$	13 $\frac{1}{2}$	10	86
Downs Co-operative Dairy Co., Jondaryan ..	38	25	14 $\frac{1}{2}$	10	87 $\frac{1}{2}$
Warwick Butter and Dairy Co., Victoria Hill ..	37	24 $\frac{1}{2}$	13 $\frac{1}{2}$	10	85
Moola Co-operative Dairy Co.	42 $\frac{1}{2}$	24 $\frac{1}{2}$	14 $\frac{3}{4}$	10	91 $\frac{3}{4}$
Rocky Creek Dairy Co.	25	24	13 $\frac{1}{2}$	10	82 $\frac{1}{2}$

TWO EXPORT, PASTEURISED, WHITE.

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible Points	50	25	15	10	100
Pittsworth Co-operative Dairy Co.	46 $\frac{1}{2}$	24	14 $\frac{1}{2}$	10	95
Mount Tyson Co-operative Dairy Co.	45	25	15	9 $\frac{1}{2}$	94 $\frac{1}{2}$
Southbrook Dairy Co.	44	25	15	9 $\frac{1}{2}$	93 $\frac{1}{2}$
Biddeston Co-operative Dairy Co.	43	24 $\frac{1}{2}$	14	9 $\frac{1}{2}$	91

TWO EXPORT, UNPASTEURISED, WHITE.

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible Points	50	25	15	10	100
*Mount Tyson Co-operative Co.	44	25	15	9 $\frac{3}{4}$	93 $\frac{3}{4}$
Downs Co-operative Dairy Co., Hodgson Vale ..	43	24 $\frac{3}{4}$	14 $\frac{1}{2}$	10	92 $\frac{1}{4}$
Warwick Butter and Dairy Co., Talgai ..	42 $\frac{1}{2}$	24 $\frac{3}{4}$	14 $\frac{3}{4}$	10	92
Downs Co-operative Dairy Co., Koondai-i ..	42 $\frac{1}{2}$	24 $\frac{1}{2}$	14 $\frac{1}{2}$	10	91 $\frac{1}{2}$
Downs Co-operative Dairy Co., Westbrook ..	42	24 $\frac{3}{4}$	14 $\frac{1}{2}$	10	91
Downs Co-operative Dairy Co., Jondaryan ..	38	24 $\frac{3}{4}$	14 $\frac{3}{4}$	10	87 $\frac{1}{4}$
Warwick Butter and Dairy Co., Victoria Hill ..	38	24 $\frac{1}{2}$	15	10	87 $\frac{1}{2}$
Warwick Butter and Dairy Co., Elbow Valley ..	41	24 $\frac{1}{2}$	14 $\frac{1}{2}$	10	90

* These exhibits have the character of pasteurised cheese.

TWO MEDIUM, PASTEURISED, OVER TWO MONTHS.

	Flavour.	Texture	Colour.	Finish.	Total.
Possible Points	50	25	15	10	100
Mount Tyson Co-operative Dairy Co.	45	25	15	9½	94½
Pittsworth Dairy Co.	45	25	14	10	94
Pittsworth Dairy Co.	46	25	14½	8	93½
Southbrook Dairy Co.	43	24	14½	9½	91
Biddlestone Dairy Co.	42	24½	14½	10	91
Warwick Butter and Dairy Co., L.J.S.	43½	25	15	9½	93
Pittsworth Dairy Co.	43	24½	15	9½	92

TWO MEDIUM, UNPASTEURISED, OVER TWO MONTHS.

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible Points	50	25	15	10	100
Pittsworth Dairy Co., No. 4	44	25	14¾	9¾	93½
Pittsworth Dairy Co., No. 3	43	25	14¾	10	92¾
Moola Co-operative Dairy Co.	42½	25	14¾	10	92¼
Mount Sibley Dairy Co.	42	24½	14¾	10	91¼
Warwick Butter and Dairy Co., Elbow Valley ..	41	24½	14¾	10	90¼
Downs Co-operative Dairy Co., Westbrook ..	41	25	14¾	10	90¾
Oakey District Dairy Co.	41¾	25	14¾	10	91½
Warwick Butter and Dairy Co., Talgai	41	24½	14¾	9¾	90
Downs Co-operative Dairy Co., Koondai-i ..	42	25	14¾	10	91¾
Oakey District Dairy Co., Kelvinhaugh	37	23	13	10	83
Warwick Butter and Dairy Co., Pratten	37	24	14¾	9¾	85½
Rocky Creek Dairy Co.	36	24	14½	10	84½
Downs Co-operative Dairy Co., Jondaryan ..	38	24	14¾	10	86¾
Warwick Butter and Dairy Co., Grey mare ..	39	24	14¾	9¾	87½
Downs Co-operative Dairy Co., Gowrie Junction	41	24½	14¾	10	90¼
Koorongarra Dairy Co.	41	24½	14¾	9½	89¾
Warwick Butter and Dairy Co., Lord John Swamp	42½	24¾	14¾	10	92
Mount Tyson Dairy Co.	42	25	15	9½	91½
Warwick Butter and Dairy Co., Victoria Hill ..	40	24½	14¾	9½	88¾
Downs Co-operative Dairy Co., Hodgson Vale ..	42	25	14¾	10	91¾
Yargullen Dairy Co.	38	24	14½	9¾	86¼
Warwick Butter and Dairy Co., Bony Mountains	38	24	15	9¾	86¾

TWO MEDIUM, PASTEURISED, UNDER TWO MONTHS.

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
Pittsworth Dairy Co.	45½	25	14½	10	95
Pittsworth Dairy Co.	44½	24½	15	9	93
Warwick Butter and Dairy Co., L.J.S. .. .	43	25	14½	9½	92½
Southbrook Dairy Co.	42	24½	15	9	90½
Biddeston Dairy Co.	42	24½	14½	9½	90½
Mount Tyson Co-operative Dairy Co. .. .	43	24	14½	9½	91

TWO MEDIUM, UNPASTEURISED, UNDER TWO MONTHS.

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
* Mount Tyson Co-operative Dairy Co. .. .	44½	24½	15	9¾	93¾
* Pittsworth Dairy Co., No. 3 factory .. .	43½	25	14¾	9¾	93
Yargullen Dairy Co.	43	25	14½	10	92½
Oakey District Co-operative Co., Kelvinhaugh ..	41	24½	14¾	10	90½
Warwick Butter and Dairy Co., Talgai .. .	41	24½	14¾	10	90½
Downs Co-operative Dairy Co., Westbrook ..	41	24½	14¾	10	90½
Warwick Butter and Dairy Co., Victoria Hill ..	42½	25	14¾	9¾	92
Downs Co-operative Dairy Co., Koondai-i ..	40	24½	14½	10	89
Oakey District Co-operative Co., Cross Hill ..	40½	24½	14½	8½	88
Warwick Butter and Dairy Co., Bony Mountains	39	24	14¾	9½	87½
Rocky Creek Dairy Co.	37	24	14	10	85
Downs Co-operative Dairy Co., Gowrie Junction	38½	24½	14¾	10	87¾
Warwick Butter and Dairy Co., Elbow Valley ..	38	24	14¾	9¾	86½
Pittsworth Dairy Co., No. 4 factory	42	25	14½	9¾	91½
Gayndah Dairy Co., Binjour	39	24	14¾	9¾	87½
Downs Co-operative Dairy Co., Jondaryan ..	39	25	14¾	9¾	88½
Warwick Butter and Dairy Co., Pratten .. .	38	24	14½	9¾	86½
Kooroongarra Dairy Co.	37½	23½	14	9½	84½
Gayndah Dairy Co., Byrnestown	38	24	14¾	10	86¾
Warwick Butter and Dairy Co., Lord John Swamp	40½	24½	14¾	10	89¾
Downs Co-operative Dairy Co., Hodgson Vale ..	41	25	14¾	10	90¾
Warwick Butter and Dairy Co., Greymare ..	41	24½	14¾	9¾	90

* These exhibits have the character of pasteurised cheese.

TWO LOAF, PASTEURISED, OVER TWO MONTHS.

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
Warwick Co-operative Dairy Co., L.J.S. ..	46	25	14 $\frac{1}{2}$	9 $\frac{1}{2}$	95
Pittsworth Dairy Co.	46	24 $\frac{1}{2}$	14	10	94 $\frac{1}{2}$
Pittsworth Dairy Co.	45	25	14 $\frac{1}{2}$	9 $\frac{1}{2}$	94
Southbrook Dairy Co.	44	24	14	10	92
Mount Tyson Co-operative Dairy Co. ..	45	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{1}{2}$	93 $\frac{1}{2}$
Biddeston Dairy Co.	43	24 $\frac{1}{2}$	14 $\frac{1}{2}$	10	92

TWO LOAF, UNPASTEURISED, OVER TWO MONTHS.

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
* Pittsworth Dairy Co., No. 4 factory ..	44 $\frac{1}{2}$	25	15	9 $\frac{1}{2}$	94
* Mount Tyson Co-operative Dairy Co. ..	43 $\frac{1}{2}$	25	15	10	93 $\frac{1}{2}$
* Moola Co-operative Dairy Co.	43	25	15	10	93
* Pittsworth Dairy Co., No. 3 factory ..	43 $\frac{1}{2}$	25	14 $\frac{1}{2}$	10	93
Warwick Butter and Dairy Co., Elbow Valley ..	41	24 $\frac{1}{2}$	14	10	90 $\frac{1}{2}$
Downs Co-operative Dairy Co., Westbrook ..	41	25	14 $\frac{1}{2}$	10	90 $\frac{1}{2}$
Oakey District Co-operative Co., Cross Hill ..	42	25	14	9	90 $\frac{1}{2}$
Warwick Butter and Dairy Co., Talgai ..	41	24 $\frac{1}{2}$	14	9 $\frac{1}{2}$	89 $\frac{1}{2}$
Rocky Creek Dairy Co.	36	24	14	10	84 $\frac{1}{2}$
Downs Co-operative Dairy Co., Koondai-i ..	42	24 $\frac{1}{2}$	14	10	91 $\frac{1}{2}$
Warwick Butter and Dairy Co., Bony Mountains ..	40	24 $\frac{1}{2}$	14	9 $\frac{3}{4}$	89
Oakey District Co-operative Co., Kelvinhaugh ..	37	23	13	9 $\frac{3}{4}$	82 $\frac{3}{4}$
Warwick Butter and Dairy Co., Pratten ..	37	24	14 $\frac{1}{2}$	9 $\frac{1}{2}$	85
Downs Co-operative Dairy Co., Jondaryan ..	41	24 $\frac{1}{2}$	14	10	90 $\frac{1}{2}$
Warwick Butter and Dairy Co., Lord John Swamp ..	42 $\frac{1}{2}$	24 $\frac{1}{2}$	14	10	91 $\frac{3}{4}$
Yargullen Dairy Co.	38	24 $\frac{1}{2}$	14	9 $\frac{3}{4}$	86 $\frac{3}{4}$
Downs Co-operative Dairy Co., Gowrie Junction ..	40 $\frac{1}{2}$	24 $\frac{1}{2}$	14	10	89 $\frac{3}{4}$
Warwick Butter and Dairy Co., Greymare ..	38	24	14	9 $\frac{1}{4}$	86
Koorongarra Dairy Co.	41	24 $\frac{1}{2}$	14	9 $\frac{1}{2}$	89 $\frac{1}{2}$
Downs Co-operative Dairy Co., Hodgson Vale ..	42 $\frac{1}{2}$	25	14	10	92
Warwick Butter and Dairy Co., Victoria Hill ..	40	24	14	9 $\frac{1}{2}$	88 $\frac{1}{2}$

TWO LOAF, PASTEURISED, UNDER TWO MONTHS.

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
Pittsworth Dairy Co.	45 $\frac{1}{2}$	25	14 $\frac{1}{2}$	9 $\frac{1}{2}$	94 $\frac{1}{2}$
Pittsworth Dairy Co.	46	25	14 $\frac{3}{4}$	8 $\frac{1}{2}$	94 $\frac{1}{4}$
Warwick Butter and Dairy Co., L.J.S. ..	45 $\frac{1}{2}$	24 $\frac{1}{2}$	14	9 $\frac{1}{2}$	93 $\frac{1}{2}$
Southbrook Dairy Co.	43 $\frac{1}{2}$	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{3}{4}$	92 $\frac{1}{4}$
Mount Tyson Co-operative Dairy Co. ..	44	24	14	9 $\frac{1}{2}$	92
Biddeston Dairy Co.	44	24 $\frac{1}{2}$	14	10	92 $\frac{1}{2}$

* These exhibits have the character of pasteurised cheese.

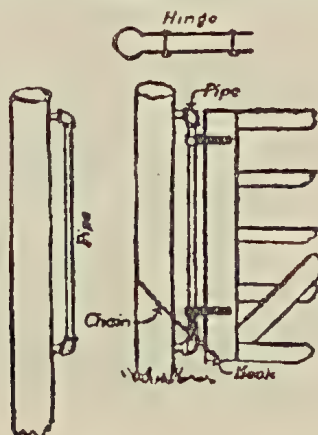
TWO LOAF, UNPASTEURISED, UNDER TWO MONTHS.

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100.
Mount Tyson Dairy Co.	44 $\frac{1}{2}$	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{3}{4}$	93 $\frac{1}{2}$
* Pittsworth Dairy Co., No. 3 factory	43 $\frac{1}{2}$	25	14 $\frac{3}{4}$	9 $\frac{3}{4}$	93
Yargullen Dairy Co.	43	25	14 $\frac{1}{2}$	10	92 $\frac{1}{2}$
Downs Co-operative Dairy Co., Westbrook . .	41	24 $\frac{1}{2}$	14 $\frac{1}{2}$	10	90
Warwick Butter and Dairy Co., Elbow Valley . .	38	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{3}{4}$	86 $\frac{3}{4}$
Rocky Creek Dairy Co.	37	24	14 $\frac{1}{2}$	9 $\frac{3}{4}$	85 $\frac{1}{4}$
Warwick Butter and Dairy Co., Talgai	41	25	14 $\frac{1}{2}$	9 $\frac{3}{4}$	90 $\frac{1}{4}$
Downs Co-operative Dairy Co., Hodgson Vale . .	41	24 $\frac{1}{2}$	14 $\frac{1}{2}$	10	90
Oakey District Co-operative Co., Cross Hill . .	40	24	14 $\frac{1}{2}$	10	88 $\frac{1}{2}$
Warwick Butter and Dairy Co., Bony Mountains . .	39	23 $\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{1}{2}$	86 $\frac{1}{2}$
Downs Co-operative Dairy Co., Koondal-i . . .	40	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{3}{4}$	88 $\frac{3}{4}$
Warwick Co-operative Dairy Co., Victoria Hill . .	42 $\frac{1}{2}$	24 $\frac{3}{4}$	14 $\frac{3}{4}$	9 $\frac{3}{4}$	91 $\frac{1}{2}$
Pittsworth Dairy Co., No. 4 factory	42	25	14 $\frac{1}{2}$	9	90 $\frac{1}{2}$
Downs Co-operative Dairy Co., Jondaryan . . .	39	25	15	10	89
Warwick Butter and Dairy Co., Pratten	38	24	14 $\frac{1}{2}$	9	84 $\frac{1}{2}$
Oakey Dairy Co., Kelvinhaugh	41	25	14 $\frac{1}{2}$	9 $\frac{1}{2}$	90
Gayndah Dairy Co., Binjour	39	24 $\frac{1}{2}$	14 $\frac{3}{4}$	9	87 $\frac{1}{4}$
Downs Co-operative Dairy Co., Gowrie Junction . .	38 $\frac{1}{2}$	24 $\frac{1}{2}$	14 $\frac{1}{2}$	10	87 $\frac{1}{2}$
Warwick Butter and Dairy Co., Lord John Swamp . .	40 $\frac{1}{2}$	25	14 $\frac{1}{2}$	10	90
Kooroongarra Dairy Co.	41	25	14 $\frac{3}{4}$	9 $\frac{1}{2}$	90 $\frac{1}{4}$
Gayndah Dairy Co., Byrnestown	35	23	14	10	82
Warwick Butter and Dairy Co., Greymare . . .	38	24 $\frac{1}{2}$	14 $\frac{3}{4}$	10	87 $\frac{1}{4}$

* These exhibits have the character of pasteurised cheese.

A SELF-CLOSING GATE.

The very best hinges will allow a gate to sag some, and it also frequently happens that the gateway fills in so that it is necessary to remove the hinges and the device illustrated is adjustable to height, and the short chain attached causes the gate to swing shut of its own weight. A long piece of inch pipe with two elbows and two short pieces of pipe at each end constitutes the half of the hinge attached to the



post. Holes are bored near the top and the bottom, and the short pipe driven in tightly. Strap-iron hinges of the form shown are attached to the gate, the ring portion encircling the pipe. A short chain is attached by a heavy staple to one side of the gate post, and well towards the back, on the side opposite the way the gate opens. The other end of this chain is open; the chain is partially wrapped around the post and raises the gate over small obstructions. When released the gate will close of its own weight.—“Country Gentleman.”

AN INTRODUCED DOG TICK (*Rhipicephalus sanguineus*).*

The ticks submitted are examples of one of the Dog Ticks, named *Rhipicephalus sanguineus*, whose occurrence in Australia was first made known by the writer in 1906.

As its generic name—*Rhipicephalus*—might imply, it is a tick related to the ordinary Red Water Cattle Tick, and not only so, but may also attach itself to these animals (cattle): not, however, with serious ill-effects.

In fact, at the time abovementioned, the tick was received by me as coming from this animal-host, and as being regarded as *Rhipicephalus annulatus*, so notorious for Red Water propagation.

I, however, stated even then that I had identified it as a tick "infesting dogs at Burketown and Bowen," and my subsequent Reports have recorded its very wide occurrence inland from Brisbane, in the far north, and in the western districts also.

It is not surprising then that it should be found occurring in millions in some spots in the Gilbert River district.

As a dog-parasite, the relation between tick and canine is of especial significance, for it is known elsewhere as the transmitter of *Piroplasma canis*, just as the ordinary cattle tick is the transmitter of *Piroplasma bigeminum*—the in-blood-occurring organism occasioning Red Water.

However, this hamatazoon—*P. canis*—does not in dogs produce a disease akin to the latter, but a very serious malady named malignant jaundice.

This fact was dwelt upon by the present writer in his Annual Report of 1917 (and elsewhere also). To cite this, the following was affirmed:—"It must not be overlooked that, as Christophers has shown, it is one of the agents capable of conveying canine piroplasmosis—a very serious dog disease—from animal to animal, and that its action in this respect would doubtless be very soon exercised in Queensland, were this malady ever introduced in canines from overseas (e.g., South Africa), an event very probable of occurrence under our present system of quarantine" (*op. cit.* p. 6). How serious might prove such an event as that referred to may be concluded when regard is had to the extent in which dogs subserv the purposes of our pastoral industries. Let us hope that the fatality, to which the "Graziers' Journal" correspondent alludes to, does not constitute a demonstration of the truth of this anticipated introduction being within the range of what was then probable.

The difficulty in dealing with *Rhipicephalus sanguineus*, the fact of its wide distribution, and of its numerous occurrences, find their explanation in the following facts:—

As in the case of its ally the Red Water Cattle Tick, it is very prolific and adapted to a wide range of climatic conditions, but—and in this respect unlike the latter ixodid—moreover, it has a habit of dropping from its animal host (dog) at each of its two moults, and not only when adult; and thus it does not only establish parasitic relationship when a larval tick, but at two epochs in its life subsequent to this as well. Thus a single tick may occur successive on three individual animals, and there are thus, three times as many provisions for dog infestation as there are with the cattle tick and its attachment to its host.

So, too, where the ticks occur there are always individuals present to infest dogs, and dogs are continuously colonising new localities with them. Our experience in Brisbane is, that with dogs living under domestic conditions these animals may be freed from their presence by dip fluids; and, when special care can be taken, protected from further infestations. It is difficult to conceive how the same results could be secured in the case of dogs connected with a cattle- or sheep-station. Meanwhile, having due regard to the above facts pertaining to the life history of the pest, efforts should be made to secure this result.

However, the high expediency of preventing the introduction, to Australia and to this State, of canines harbouring in their blood, &c., the parasite of malignant jaundice must be fully recognised as an urgent necessity.—HENRY TRYON, Entomologist.

* This Press communication had reference to an occurrence in the Gilbert River district and to the inquiry that the hordes of dog ticks noticed there prompted.—H.T.



PLATE 1.—CONFERENCE OF MINISTERS OF AGRICULTURE, SYDNEY, 6TH TO 11TH MAY, 1924.

Top Row.

Left to Right (standing).
Messrs. Adam (Vic.)
W. J. Allen (N.S.W.)
P. R. Scott (Vic.)
J. H. Thynne (Vic.)
M. Henry (N.S.W.)

Second Row.

J. Hadlington (N.S.W.)
Dr. Darnell-Smith
(N.S.W.)
W. B. Gurney (N.S.W.)
H. G. Crofts (Q. land)
A. H. E. McDonald
(N.S.W.)
H. L. Manuel (N.S.W.)
A. H. Benson (Q. land)
E. Houghton (N.S.W.)

Third Row.

A. A. Ramsay (N.S.W.)
A. H. Cory (Q. land)
J. N. Whittet (N.S.W.)
F. F. Coleman (Q. land)
L. T. Macinnis (N.S.W.)
W. A. N. Robertson
(Vic.)
W. L. Sumner (S.A.)
J. M. Ward (Vic.)
E. Harris (N.S.W.)
H. Luckman (N.S.W.)

Bottom Row.

J. C. Brummich (Q. land)
J. C. Hutton (Vic.)
Geo. Valder Under Sec.
Dep. of Agric. N.S.W.)
R. T. Ball (Minister for
Public Works N.S.W.)
W. N. Gillies, M.L.A.
(Acting Premier and
Min for Agric. Q. land)
F. A. Chaffey, M.L.A.
Min for Agric. N.S.W.)
T. Butterfield, M.L.A.
(Min. for Agric. S.A.)
J. Bolton, M.L.A. (Min.
for Agric. Tasmania)
Professor A. J. Perkins
(Direc. of Agric. S.A.)
E. Graham (Q. land)

MILKING RECORDS, COLLEGE DAIRY HERD, MAY, 1924.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Butter.	Remarks.
			Lb.	%	Lb.	
College Mignon..	Jersey ..	24 Mar., 1924	600	5.4	38.10	
College Prima Donna	Friesian..	9 April, 1924	750	3.9	34.20	
Iron Plate ...	Jersey ...	3 Mar., 1924	600	4.3	30.00	
College Cobalt ..	"	14 Sept., 1923	540	4.7	29.70	
College Sunrise..	"	3 Jan., 1924	510	4.3	25.50	
College Meadow Sweet	Friesian..	17 Mar., 1924	600	3.7	25.80	
Lady Peggy ..	Ayrshire	24 April, 1924	570	3.7	24.60	
Yarraview Village Belle	Guernsey	3 April, 1924	480	4.1	23.10	
Hedges Nattie..	Friesian..	21 Nov., 1923	480	4.0	22.20	
Netherton Belle	Ayrshire	20 Oct., 1923	450	3.9	20.40	
Yarraview Snow-drop	Guernsey	7 Sept., 1923	330	5.2	20.10	

A TON OF PORK IN SIX MONTHS.**POLAND-CHINA RECORDS.**

E. J. SHELTON, H.D.A., Instructor in Pig Raising.

It has been a special claim of the breeders of Poland-China pigs in the United States of America and in Canada, that there is no other breed of pig capable of producing litters which will grow as rapidly and mature as light to medium weight bacon pigs as early, and as economically, as these of this now famous American corn-belt hog; indeed they claim to be able to develop Poland-China litters that will produce a ton of pork in six months, and have demonstrated that this can be done by winning the "Ton Litter Contest" at several of their great live stock expositions recently.

They also claim that the present day Poland-China is a pork-producing machine that in the hands of an intelligent breeder and feeder will produce pork products more economically than any other breed or combination of breeds of swine, and that Poland-Chinas mature to heavier weights (if need be) more rapidly than other breeds. This claim has been established by the official weights of the Swine Carcass Contests at the National Swine Shows.

The market feeder who would conduct his feeding operations with the idea of making a maximum of profit, must give consideration to these facts. It is a business proposition, and as such it is entitled to the same careful attention that any other business problem would receive. It is true that topping the market with a good line of bacon pigs gives the breeder a delightful sensation; but, unfortunately, it often happens that the sensation is confined to the head and does not extend to the pocket book. This is especially true when the "market toppers" have been produced at a greater cost per pound than another lot which sold at a slightly lower figure and which showed a more satisfactory margin of profit over cost of production. Unless the "market topper" can be produced economically and marketed at a profit, there is little to be gained.

Poland-Chinas have been developed to produce pork at the lowest possible cost per pound and they have few equals in this respect. Australian experience demonstrates that when given reasonable care and attention, and where judiciously crossed with other quick-growing, prolific types, excellent results are obtained.

It will be well, however, for pig breeders to note that these remarks refer to the more recently introduced types and not to those "old spotted black and white" types which were common in Queensland years ago. These older types are now out-of-date in so far as their usefulness for the purpose of stud breeding goes, and seeing that the record of their breeding is unreliable, they cannot be recommended even for the production of the better type bacon pig so much in demand, as they are invariably coarser and less profitable than the types illustrated in this issue.

The modern Poland-China is a breed that pig men would do well to study carefully, a special article dealing with their development and usefulness under Queensland conditions appeared in our March issue.

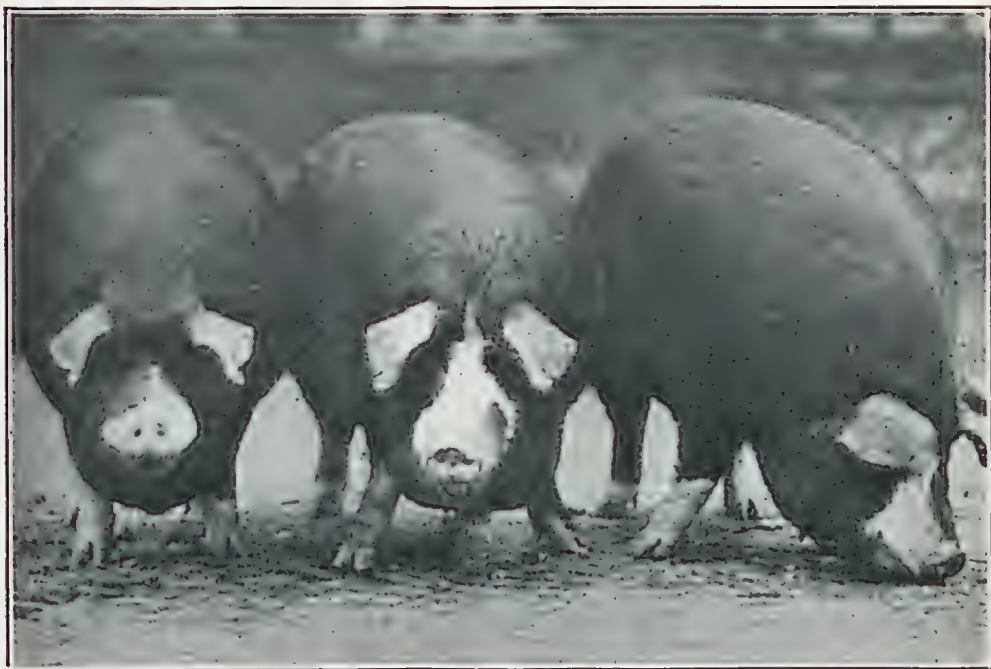


PLATE 2.—POLAND-CHINA CHAMPIONS.

The Champion Pen of Poland-China Barrows at a recent American Live Stock Exposition. Note the trueness to type and attractive appearance of these animals.

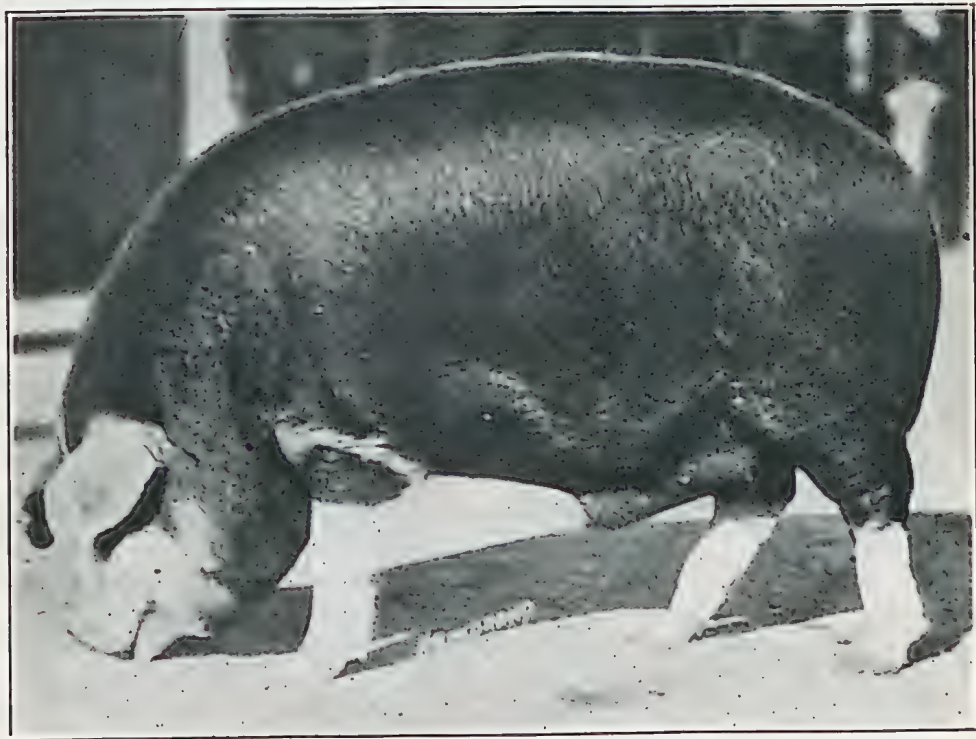


PLATE 3.—A PROMINENT PRIZE-WINNING POLAND-CHINA AT CANADIAN SHOWS.

The compactness, depth, and even quality of this Pig is worthy of note; also the characteristic colour markings



PLATE 4.—THE HAMPSHIRE OR BELTED BREED. A CHAMPION CAR LOAD.

The Americans claim the Hampshire as one of their own productions. They are essentially bacon pigs. So far the Hampshire has not been introduced into Australia. English types similar in appearance are the Wessex Saddleback and the Essex Breeds.

THE PIG INDUSTRY.

Some notes on remarks made by Mr. E. J. Shelton, H.D.A., Instructor in Pig Raising, on the occasion of the opening of the North Queensland Co-operative Bacon Company's new bacon factory at Floreat Siding, Mareeba, 17th May, 1924.

Though it could hardly be claimed that the pig industry in Australia (nor here in these wonderful tableland and hinterland districts) has, up to the present, been developed to anything like the proportion possible, or to those that have been attained in the countries overseas, it is freely acknowledged that we have all the essentials to success in so far as climatic conditions and rainfall are concerned, and here in the North you have an organisation fashioned on truly co-operative lines which enables supplies to be handled in the most expeditious manner possible in a district which, up to the present, has suffered somewhat from isolation from both the markets of the North, South, West, and also from the nearer markets in the East. You have also a useful class of breeding stock available on which to work in building up your herds.

Possibly in comparison with some of the Eastern countries, or even with America, Canada, and Denmark, we lack the abundant supply of cheap native labour, and an



Photo: W. H. Brunker, Kulara.

PLATE 5.—NORTH QUEENSLAND CO-OPERATIVE BACON COMPANY'S NEW BACON FACTORY AT FLOREAT SIDING, MAREEBA, NORTH QUEENSLAND.

even more important consideration, the supply of cheap concentrated pig foods such as meat meals, various oil meals, and cheaper cereal grains produced as a result of the utilisation of cheaper and more readily controlled agricultural labour.

It is a well known fact that the world's requirements in the way of pork, bacon, and hams are so greatly in excess of production that there is an unlimited field for development along the lines of breeding and fattening pigs both for local consumption as well as for export, whilst the importance and trade value of the industry is becoming more generally appreciated. The open-air life which stock lead here, where climatic conditions are so favourable, tends to a reduction of losses from disease, and it is fortunate for Australia to be able to boast that there are no serious infectious nor contagious pig diseases (apart from tuberculosis) affecting our herds. Swine fever, at one time prevalent, has, thanks to your State's complete system of handling these outbreaks, been wiped out, whilst we are not worried by such fearful diseases as foot and mouth disease, &c., which even now is costing other countries millions of pounds to control. Tuberculosis is one of the worst ailments with which we have to deal, but though statistics prove that in this regard

we can compare more than favourably with other pig-raising countries, it is up to us to assist the Department of Agriculture and Stock in its efforts to eradicate this pestilence also.

When one realises that pigs multiply very rapidly and mature much earlier on less food, and produce more nourishing and digestible flesh than any of the other farm animals, it is not to be wondered at that there is an increasing interest in the welfare of the "humble hog." Cattle at their best increase at the rate of from 80 to 90 per cent. per annum, sheep vary between 100 and 150 per cent., whilst pigs, if given any sort of a chance at all, increase at from 1,000 to 1,800 per cent. per annum, and then the carcass is more valuable at per pound than that of either sheep or cattle, pork and bacon having a higher food value, particularly for people living in colder or more temperate climates than that which is generally believed to be common in Queensland.

There is no reason why pig-raising should not be a very profitable avocation if properly managed, and the industry is one into which a man with limited capital can venture, though it is by no means easy to state the minimum capital required. To the man with a fair amount of capital there is abundant scope, particularly on the Tablelands, for there are many thousands of acres of good land available at comparatively low cost on which pig farming could be successfully conducted, either as a specialised business or as an adjunct to dairying or mixed farming.

Having thus shown that the industry is an attractive and payable one, it is somewhat difficult to understand why in general pig-raising has not developed more rapidly. The statistics for the year 1923 indicate that the pig population of the Commonwealth is but approximately 1,000,000 head. There were 1,110,721 head in the year 1911, but since then up to and from the year 1921, when the number had decreased to 764,406, there has been a steady increase, but we are not yet up to the figure of thirteen years ago, whilst our population is increasing by leaps and bounds and the area under cultivation ever widening. America with her 70,000,000 pigs has barely been able to keep pace with the increased demand for pork and bacon, whilst Denmark, Ireland, and Canada have been hard pressed to supply sufficient to satisfy English requirements.

For the three months ending November, 1923, Great Britain alone imported 2,467,746 cwt. of hams and bacon, equal to 2,500,000 pigs, or more than twice the number of pigs in the Commonwealth. During these three months Denmark (a tiny spot in the North Sea in comparison with Queensland) exported no fewer than 1,000,000 pigs to England without depleting her supply of breeding stock. Of course, it is not all beer and skittles, for these pigs if shipped from Australia at our present rates of handling would not have returned as much to the local producer here as he has been receiving locally during the same period; for whilst prices ranged from, say, 8d. per lb. in the North and nearer 10½d. per lb. in the South, the pigs purchased by Great Britain panned out at around 5d. per lb. in comparison to the other figures quoted. Hence we see that before we can hope to build up a successful export outlet we must adopt more up-to-date methods of feeding, housing, caring for, and, shall I say, branding our pigs. Certain it is that under a properly organised system of growing foods and feeding on the open-air system, the cost of production could be reduced to a much lower figure here than in any of the other countries named. The dairy farmer can usually produce his pigs at a minimum price because he utilises large quantities of otherwise waste produce, such as skim milk, &c.

Regarding the sale system, in recent years the system of selling pigs by actual weight over the scales at country saleyards and paying for them on a basis of 30 per cent. below actual live weight has been introduced in Southern Queensland, and has given such good results that the system (with certain variations) is now generally regarded as a desirable one. These scales have been introduced by proprietary or private concerns in opposition to the older system of consigning direct to the factory as is the case with the co-operative factories throughout the Southern districts of Queensland and the other States.

Your Pig Pool has been introduced and your bacon factory established under an entirely new system, and let me tell you the eyes of Australia are on these Tablelands to-day, and thousands of farmers are watching with interest the development of your various pools. Let me express the sincere hope that all party difference will be set aside, and a solid co-operative backing given to your board of management in its efforts to successfully develop your Pig Pool operations. The Department of Agriculture and Stock are keenly alive to the importance of your ventures, as instanced by my visit to the Tablelands as the direct representative of that department, and by my presence with you on this auspicious occasion. May your efforts be crowned with success and may the "humble hog," like the humble Ford, help you over the hills of difficulty with which so many of the newer settlers are faced.



PLATE 6.—SHADE TREES AND SHELTER SHEDS ARE OF PRIME IMPORTANCE
TO THE PIG FARMER.

The photograph shows portion of the yard accommodation at the Hawkesbury College Stud Piggery, Richmond, New South Wales.

THE EMPIRE CHALLENGE GOLD CUP FOR COMPETITION AMONG BERKSHIRE PIG BREEDERS.

Some time ago advice was received by the Department of Agriculture and Stock, through the Official Secretary of Australia House, London, of the desire of the President and Council of the British Berkshire Society to donate one or more Gold Cups for competition amongst breeders of the Berkshire pig who exhibit their animals at Australian Shows. Negotiations have been in progress since that date, and quite recently a further letter was received from which the following extract has been taken:—

“With regard to the matter of the Gold Cup, I am to state that the Council of the British Berkshire Society has decided to donate a Challenge Cup to be called ‘The Empire Challenge Cup’ for competition at Australian Shows.”

As regards the conditions under which this challenge cup is donated, the Council has not imposed very rigid conditions, as they do not wish to cause any difficulty in connection with its award at Dominion Shows where the breed is well represented. So long as it is awarded to the Champion Berkshire Pig of either sex, and treated as a Challenge Cup, the details are left to the societies through which the Cup is offered. In the case of the Melbourne Royal it will, I think, be won outright if won by the same exhibitor twice in succession or three times in all, but in the case of other shows it will be treated as a perpetual Challenge Cup, unless otherwise requested.

It is understood there is some question of two Cups being granted, but at present it would appear that the Society is presenting one only.

Queensland Berkshire breeders have now an opportunity to come forward with suggestions as to the conditions under which this cup should be competed for. It is unfortunate that owing to distance, heavy freight charges and incidental expenses, as well as loss of time in travelling to and fro, breeders here have not found it a payable proposition to exhibit and compete at Southern Shows, though Mr. W. J. Warburton, of Northgate Junction, has been an exhibitor of Berkshires and Middle Yorkshires at Sydney Royal Show for many years.

It is suggested, therefore, that an effort should be made to induce the British Berkshire Society to donate a Gold Cup for competition amongst Queensland breeders, and to this end circular letters have been sent to those Agricultural Societies who are likely to be most interested, as well as to the Secretary of the Queensland Branch of the Berkshire and Yorkshire Society of Australasia. As it is the Department's desire that the Gold Cup be made available for competition during this or next year, any exhibitor of Berkshire pigs having suggestions to offer should communicate with the Secretary of the Royal National Agricultural Association of Queensland, Courier Buildings, Queen street, Brisbane, as it is expected that when the cup arrives the Royal National Show will be the final ground on which eligible animals will have to compete. Meantime, doubtless, interested Agricultural Societies will also move in the matter.—E. J. SHELTON, H.D.A., Instructor in Pig Raising.



PLATE 7.—A QUEENSLAND FRUIT EXHIBIT, ROYAL SYDNEY SHOW, EASTER, 1924.

In a close competition, the Stanthorpe Exhibit was awarded 72 points. Eight weeks in cold storage, made necessary by the lateness of Easter this year, robbed the Queensland fruit of its bloom. Fruit in the Southern State exhibits, direct from the tree, had the advantage of freshness of bloom and consequently were higher, by a few points only, in the scale of awards.

THE ORANGE TREE BUG (*Oncoscelis sulciventris*, Stål.).*

SUPPLEMENTARY NOTES.

By A. A. GIRAULT, Assistant Entomologist.

LETTER OF TRANSMITTAL.

Department of Agriculture and Stock,
Brisbane.

Sir,—This is a Supplement to the Bulletin (Jan., 1924) on "The Orange Tree Bug (*Oncoscelis sulciventris*, Stål.)" by A. A. Girault, Assistant Entomologist, and covers further field investigations to those alluded to therein.

The position now reached may be summarised as follows:—

(1) Previously it was demonstrated that the insect is not absent from the orangeries during the winter of each year, but is present then and therein in the peculiar II. stage, discovered by us—in other words, that the Orange Bug does not arrive each spring from outside their limits, in the adult or winged phase.

(2) It is now further made evident, that one cycle in the insect's life-history occupies the four seasons—winter, spring, summer, and autumn—and that, therefore, any interruption of this cycle by man's interposition, involving mechanical measures or the use of an insecticide (*e.g.*, "fumigation"), intercepts its life and so determines its existence as a pest, and further that—

(3) In the operation of an egg parasite—the chalcid wasp—*Eupelmus poggioni* (Girault), now first made known, Nature is prepared to intervene and exterminate the insect when once its numbers have largely been reduced.

In these facts are found the ground for urging the adoption at all costs, and at one and the same time, of the known effective procedures for destroying the insects, throughout the Blackall area, by concerted effort in which all citrus growers therein co-operate.

HENRY TRYON, Chief of Division.

The following notes are to be regarded as supplementary to an account of this insect printed a few months ago (see footnote), and will make our knowledge of its life-cycle complete.

Supplementary Life-History Notes.

Additional data have been obtained in regard to this, tabulated as follows:—

Place.	Date.	I.	II.	III.-IV.	V.	Adults.	Eggs.	Totals.
Banyo ..	Dec. 31, 1923	0	0	0	10	85	5	100
Landsborough	Feb. 21, 1924	40	12	0	0	12	14 (1 mass)	78
Raby Bay ..	April 3, ..	0	9	0	0	5	14	28
Montville ..	April 17, ..	43	864	0	0	45	42 (3 masses)	994

Thus, after December, 1923, there is a marked absence of any of the nymphal stages III.-V. and a gradual increase, as winter approaches of stage II.

At Banyo, 31st December, 1923, the adults were in clusters of from 12-40, feeding as nearly as possible from one spot; mating was in progress and fertile eggs had already been laid. When shaken from the tree the adults took wing, exposing the conspicuous red of the dorsal abdomen. The few adults seen at Landsborough were also in a cluster, and mating was still in progress. The nymphs I. were often in clusters upon the under leaf surface and the II.'s found here appeared to have been developed from these I.'s. They were bright in colour but flat as if unfed. At Raby Bay, the II.'s had the same appearance. Mating was still in progress there, and though no healthy eggs were found upon the trees, ovaries bore them.

* See "Queensland Agricultural Journal," January, 1924, XXI., pp. 57-78, pls. I.-IV. Bull. No. 1, Div. Ent. and Plant Pathology, January, 1924, 24 pp., pls. I.-IV.

At Montville, 17th April, 1924, mating was also still occurring; ovaries bore large eggs but no healthy eggs were found upon the trees. The adults and II.'s were not feeding; in one instance, though, one of a mating pair was observed feeding upon a terminal stem. The I.'s were swollen more or less, as if with food and the human skin was stained if they were crushed upon it.

A Parasite of the Egg.

A mass of unhealthy eggs obtained at Raby Bay, 3rd April, 1924, proved to be infested with *Eupelmus poggioni* (Girault) which commenced to emerge a week or so later. The parasite appears to be a primary one.

New Localities.

The orange-tree bug has not proved abundant within its known range except on the Blackall Range. It has been found at Landsborough, Moggill, near Riverview, and at Raby Bay, but not around Rockhampton or west of Toowoomba, that is, outside of its recorded range, though looked for.

Additional Description Notes.

The egg is minutely punctulate and bears a large operculum or "lid," which is studded around its edges with regularly spaced minute tubercles or obtuse teeth (about 48-52). In order to differentiate the young nymphs from the same stage of other bugs very similar, it ought to be stated that the margins of their bodies are not jagged or indented notably, but, though that of each segment is more or less curved, the whole makes an entire margin. There is a notable indentation at the extreme anal end only.

The adults and nymphs of this species do not feed from the surface of fruit larger than about $1\frac{1}{2}$ inches in diameter, as do the various stages of the Green Horned Bug (*Biprorulus bibax*). One lot of I.'s kept unfed since hatching died without development within ten days.

Errata.—In the account referred to above (see foregoing footnote), the two sexes were confused, the male mistaken for the female. Therefore, all that applies therein to the female referred to the male and *vice versa*. It is the male, for instance, that bears the median channel upon ventral abdomen.

QUEENSLAND TREES.

No. 31.

By C. T. WHITE, F.L.S., Government Botanist, and W. D. FRANCIS,
Assistant Botanist.

The picture of the Bunya Pine, which is reproduced on page 32, was taken by Professor Wilson, of the Arnold Arboretum, in an area of the Imbil rain forest in which the surrounding vegetation had been felled. The long branchless lower stem is a feature of almost all large trees growing in the rain forest or scrub, and is caused by the tree growing upwards towards the light and the lower branches falling owing to the lack of sunlight. The trees growing in the open spaces, such as in parks, are generally much less slender and have branches much lower on the stem. The Bunya Pine, *Araucaria Bidwilli*, is only found in a native state in a limited part of the south-eastern portion of the State. It is plentiful in the scrubs of the Bunya Mountains and the Blackall Range, and occurs as far north as the neighbourhood of Gympie.

The other field picture appearing in this issue represents one of the Bolly Gums and is known as *Beilschmiedia elliptica*. It belongs to a natural order of plants, the Lauraceæ, which are very common in the dense scrubs, and it is often a matter of great difficulty to recognise the various species by their appearance in the field. This species has so far been found at Kin Kin and Fraser Island, but as it becomes better known it will, in all probability, be found in other scrubs of the North Coast Line.



Photo: W. D. Francis.]

PLATE 8.—A BOLLY GUM (*Beilschmiedia elliptica*) in the rain forest of Kin Kin, North Coast Line.

EGG LAYING: N.U.P.B.A., ZILLMERE.

National Utility Poultry Breeders' Association's Competition—Report: 3,029 eggs were laid during June, an average of 16.8 eggs per bird for the whole competition. The average in the respective sections was, White Leghorns 15.3, Black Orpingtons 21.6, and Other Varieties 14.0.

Two deaths occurred, No. 59 W.L. belonging to A. Staib died as the result of an injury; and No. 43 W.L. (Mr. P. F. Adams), from bowel trouble.

Mr. E. Walters No. 127 B.O. had laid an unfinished sequence of 50.

WHITE LEGHORNS.

Pen No.	Owner.	June.	Total.	Pen No.	Owner.	June.	Total.
104	Oakleigh P.F.	25	71	108	W. L. Howard	22	39
85	Enroh Pens	24	69	25	H. T. Britten	20	38
20	A. Hodge	21	64	40	R. C. Cole	16	38
102	A. S. Walters	22	64	101	A. S. Walters	21	38
103	Oakleigh P.F.	18	63	87	Enroh Pens	6	37
84	W. Wakefield	21	62	38	H. Fraser	21	36
97	K. A. Sommerlad	22	62	74	E. C. Raymond	13	36
105	Oakleigh P.F.	25	62	45	P. F. Adams	16	36
54	G. E. Rogers	20	61	8	H. Sturman	21	35
19	A. Hodge	19	60	55	J. Hutton	0	35
21	A. Hodge	20	60	53	G. E. Rogers	23	34
67	Kidd Bros.	17	58	61	Carinya P.F.	18	33
66	E. Tracey	14	57	80	J. E. G. Purnell	5	33
78	M. F. Newberry	15	57	13	G. Marks	20	32
82	W. Wakefield	24	57	56	J. Hutton	18	32
27	H. T. Britten	17	55	58	A. Staib	21	32
6	H. T. Pember	18	54	39	H. Fraser	18	31
35	J. L. Chapman	20	54	174	S. L. Grenier	15	31
60	A. Staib	19	54	11	W. J. Berry	22	30
93	C. A. Hodgson	13	54	99	K. A. Sommerlad	19	26
49	J. Earl	15	53	3	F. J. Williams	9	29
50	J. Earl	20	53	2	F. J. Williams	16	28
81	J. E. G. Purnell	20	53	51	J. Earl	13	28
30	M. H. Campbell	20	52	10	W. J. Berry	19	27
76	M. F. Newberry	18	52	106	W. L. Howard	21	27
89	R. Duff	19	51	14	G. Marks	14	26
65	E. Tracey	5	50	98	K. A. Sommerlad	19	26
90	R. Duff	14	50	44	P. F. Adams	1	26
95	G. Williams	22	50	23	A. Neil	20	25
28	M. H. Campbell	17	49	9	H. Sturman	12	24
57	J. Hutton	12	49	83	W. Wakefield	16	24
88	R. Duff	20	49	96	G. Williams	16	23
64	E. Tracey	18	48	15	G. Marks	21	21
70	J. R. Wilson	23	48	37	H. Fraser	21	21
71	J. R. Wilson	20	48	26	H. T. Britten	4	20
52	G. E. Rogers	18	47	17	J. T. Webster	7	19
75	E. C. Raymond	17	47	24	A. Neil	8	19
79	J. E. G. Purnell	22	47	34	J. L. Chapman	13	19
100	A. S. Walters	12	47	62	Carinya P.F.	3	18
12	W. J. Berry	11	46	107	W. L. Howard	17	18
29	M. H. Campbell	15	46	173	S. L. Grenier	7	18
32	W. and G. W. Hindes	15	46	72	J. R. Wilson	10	17
42	R. C. Cole	14	45	77	M. F. Newberry	3	16
16	J. T. Webster	19	44	91	C. A. Hodgson	9	15
22	A. Neil	14	43	4	H. T. Pember	9	13
41	R. C. Cole	20	43	43	P. F. Adams	0	18
48	R. C. J. Turner	20	43	33	W. and G. W. Hindes	8	12
18	J. T. Webster	16	42	59	A. Staib (Replace		
92	C. A. Hodgson	21	42		13/6/24)	11	11
35	J. L. Chapman	18	41	63	Carinya P.F.	9	9
46	R. C. J. Turner	20	41	69	Kidd Bros.	6	9
73	E. C. Raymond	18	41	47	R. C. J. Turner	6	8
1	F. J. Williams	9	40	172	S. L. Grenier	3	8
68	Kidd Bros.	22	40	7	H. Sturman	5	6
31	W. and G. W. Hindes	13	39	5	H. T. Pember	5	5
86	Enroh Pens	12	39	94	G. Williams	0	0

BLACK ORPINGTONS.

Pen No.	Owner.	June.	Total.	Pen No.	Owner.	June.	Total.
126	T. Brotherton	25	78	139	J. Pryde	23	58
114	W. R. Wilson	25	76	109	T. Fanning	24	57
110	T. Fanning	27	75	138	W. S. Adams	23	57
124	T. H. Brotherton	27	73	131	G. E. Rogers	27	52
143	F. P. Cummings	23	73	145	Everlay P.Y.	27	52
156	J. Hutton	26	72	150	E. C. Raymond	23	49
116	G. L. Campbell	25	71	153	Enroh Pens	21	49
142	F. P. Cummings	28	69	123	J. Potter	26	46
115	G. L. Campbell	23	67	148	E. C. Raymond	15	46
117	G. L. Campbell	22	67	132	G. E. Rogers	20	43
130	G. E. Rogers	26	66	136	W. S. Adams	27	43
144	F. P. Cummings	21	66	125	T. H. Brotherton	22	44
127	E. Walters	30	65	134	C. C. Dennis	12	41
154	J. Hutton	25	65	149	E. C. Raymond	19	40
155	J. Hutton	26	64	112	W. R. Wilson	14	34
119	H. M. Chaille	24	62	146	Everlay P.Y.	25	29
120	H. M. Chaille	23	62	140	J. Pryde	20	27
147	Everlay P.Y.	27	62	118	H. M. Chaille	14	24
113	W. R. Wilson	25	61	135	C. C. Dennis	18	23
129	E. Walters	27	61	121	J. Potter	10	19
122	J. Potter	24	60	151	Enroh Pens	18	18
111	T. Fanning	24	58	152	Enroh Pens	11	18
128	E. Walters	22	58	137	W. S. Adams	7	13
133	C. C. Dennis	21	58	141	J. Pryde	0	0

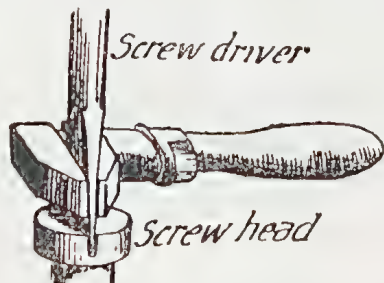
OTHER VARIETIES.

Pen No.	Owner.	June.	Total.	Pen No.	Owner.	June.	Total.
159	Messines P.F. (R.I.R.)	22	54	164	A. S. Walters (B.R.)	19	19
167	W. H. Forsyth (S.W.)	12	43	179	J. Ferguson and Sons (B.L.)	6	17
175	Everlay P.Y. (B.L.)	21	36	161	T. C. Ollier (B.R.)	15	15
166	W. H. Forsyth (S.W.)	16	34	176	Everlay P.Y. (B.L.)	9	10
169	J. Pryde (Lang.)	12	32	162	T. C. Ollier (B.R.)	11	11
168	W. H. Forsyth (S.W.)	23	31	170	J. Pryde (Lang.)		
157	Messines P.F. (R.I.R.)	17	29		(Replace 23/6)	4	4
158	Messines P.F. (R.I.R.)	20	29	177	Everlay P.Y. (B.L.)	4	4
160	T. C. Ollier (B.R.)	24	25	171	J. Pryde (Lang.)		
165	A. S. Walters (B.R.)	18	25		(Replace 21/6)	1	1
180	J. Ferguson and Sons (B.L.)	19	21	163	A. S. Walters (B.R.)	0	0
178	J. Ferguson and Sons (B.L.)	17	20				
						3,029	7,158

C. KIDD, Hon. Secretary.

INACCESSIBLE SCREWS.

Sometimes machine screws or bolts with screw heads on the tractor, or other farm machinery, are located in places not easily accessible, so that their removal or tightening becomes a difficult task by the usual method, much to the annoyance



of the man doing the job. When this occurs place a straight, stout screwdriver in the slot of the screw head, and holding it firmly with one hand, with the other apply a wrench on the flat part of the driver as illustrated in the accompanying sketch. Then turn the wrench, using care that the driver does not slip out, also avoid applying too much pressure and breaking the screw head.



PLATE 9.—“LADY NETTIE SINGER.”

First, Gatton Test, First Type. Laid 337 eggs in 365 days, average weight 2 ounces; claimed to be a world's record. Bred by Mr. C. H. Singer, Taringa; now the property of Mr. J. Earl, Wilston.



PLATE 10.—WINNING PEN.

First, Winter Test; First, Type; First, All Breeds. Laid 1,614 Eggs in 365 days. Bred by Mr. C. H. Singer, Taringa, and now the property of Mr. J. Earl, Wilston.

CONTROL OF COTTON PESTS.

The Minister for Agriculture (Hon. W. N. Gillies) has received the following information from Mr. E. Ballard, Cotton Entomologist, upon the arrangements for the control of cotton pests during the coming season.

The three most destructive pests and the most generally distributed in Queensland are the Maize Grub (*Chloridea obsoleta*), the Peach Moth (*Dichoceris punctiferalis*), and (*Tectaconis lanksii*), the Chinese bug or Harlequin bug. There are other pests of less or only local importance, but the above are the most destructive.

Experiments Planned.

In the coming season experiments will be carried on with a view to finding, if possible, some means of controlling these insects. These experiments will be carried out in areas chosen in the Lockyer Valley, Upper Burnett, in the Callide, and in some places on the coastal area, probably the Boyne Valley. It is realised that the Maize Grub is a potential danger in that it removes the first formed squares, especially of late-planted cotton. Different methods of preventing this damage will be given a thorough trial; these will include dusting, smoke screens of different kinds, and the use of maize as a trap crop.

This latter method, where properly used, is quite efficacious, but it frequently is wrongly used, and then is more of a pest-breeding ground than otherwise. There is nothing very new in these three control methods, but the best way of applying them under Queensland conditions has to be studied. In addition, it might be mentioned that the Maize Grub in its later broods this season is very heavily parasitized, and it is possible that there will only be a light attack next season.

The Peach Moth.

The Peach Moth, from its method of attack, presents greater difficulties, and a thorough study of its habits and life history will be required before any adequate method of control can be devised. It will be sufficient to say at present that it has the first claim on our attentions.

The Harlequin Bug.

The Harlequin Bug, judging from observations which one has been able to make this season, is doing far more damage than is generally realised. Fortunately it is open to control, in that from its habit of collecting in bunches and not readily taking to the wing it can be picked by hand. The egg masses laid on leaf stalks and twigs are very easily seen and destroyed. If this work is started early in the season it should be comparatively simple to keep the pest controlled.

The Pink Boll Worm.

The Pink Boll Worm, so far only found in cotton in coastal areas, with the exception of one or two places such as Baralaba, is being dealt with by treating all seed for sowing in a Simon's Heater to destroy hibernating larvæ; also by the destruction by heat of any larvæ which may be lying up in wool packs, so that packs from an infested area may be sent to a clean area without risk. The remainder of the control measures must be applied by the farmer by cleaning up his fields thoroughly after harvesting his crop and destroying all plants and refuse, especially old bolls, &c., by fire.

Briefly, these are some of the lines of work which it is intended to pursue. Naturally the life cycle and habits of the various pests have to be studied in each of the main cotton-growing areas, as in each the problem will be difficult. Spraying, for *Earias* and *Chloridea* will be given a trial, but it does not hold out much prospect of success owing to the water difficulty and other factors. One important point to realise is that plant diseases, like human diseases, take time to study, and what might be a practicable remedy for one area might easily be impossible in another.

The extent to which any or all of the pests mentioned are parasitized and the possible use of biological means of control will not be lost sight of. In addition to such means of control as spraying or dusting, work is being carried on in conjunction with the Cotton Specialist in the effects of spacing, time of planting, and method of growing (e.g., March planting), on pest attacks and incidence of pests on ratooned cotton in different areas.



Photo. by Prof. E. H. Wilson (Arnold Arboretum).]

PLATE 11.—BUNYA PINE (*Araucaria Bidwilli*).

A specimen in felled scrub at Imbil. Two Hoop Pines are seen on left of picture and a Bunya Pine on extreme right.



PLATE 12.—PRIZE CABBAGES—AVERAGE WEIGHT, 33 LB.
Awarded first place, The Summit Show (Stanthorpe District), 1924. Grown by Mr. H. Nelson, The Summit.

THE QUEENSLAND COTTON INDUSTRY.

A FAIR TEST FOR RATOON—EXHAUSTIVE FIELD EXPERIMENTS.

REVIVAL OF COTTON-GROWING IN QUEENSLAND—EFFECT OF GOVERNMENT GUARANTEE—HIGH QUALITY FOR HIGH PRICES—BEST EXPERT ADVICE OBTAINED—A POLICY OF SAFETY FIRST—THE RESPONSIBILITY FOR SUCCESSFUL MARKETING.

The revival of the Cotton Industry in Queensland was due, in the first instance, to the policy of the Government in guaranteeing a minimum price that they believed would cover the cost of production and give the farmers a substantial profit.

This policy had resulted in a number of landowners making use of their land for the first time. . . .

Field experiments at Melton and Monal Creek, in the Upper Burnett country, also on several farmer plots in the Burnett and Central districts, were being carried out, but the results for the year were not yet complete. Spinning and laboratory tests were being undertaken through the Agent-General, and ten bales of ratoon cotton had been sent to him for spinning, and for testing the market. Samples of annual Durango and ratoon were sent to the laboratory of the British Cotton Industry Research Association, and final reports were awaited.—*Hon. W. N. Gillies.*

The Minister for Agriculture and Stock (Hon. W. N. Gillies), in the course of a recent important Press statement on the ratoon cotton controversy, said that although it was not his intention to enter into a newspaper controversy with Press correspondents, he felt that these particular articles called for some comment from himself. With respect to a recent cabled statement, it was not expected that Mr. Daniel Jones would hide his light under a bushel, or under the two bales of ratoon cotton which he was said to have taken with him as samples, but the information that he had been able to give so far was of little value because it lacked advice on two essential points—namely, the price and the approximate number of bales that could be sold at that price. This advice, it was hoped, would be forthcoming later.

Coming to recent Press criticism, and overlooking for the time being the question as to whether the agricultural representatives and cotton experts of the newspapers had had sufficient experience in the cotton world to enable them to advise the Government what they should do, it appeared to him that they, in common with all other advocates of ratooning, had conveniently lost sight of certain essential facts.

Effect of the Guarantee.

It was well known to the Government, and to everyone else who had taken any interest in the question, that cotton was successfully grown and was an important industry in Queensland over fifty years ago. The good prices existing at the time of the American Civil War gave cotton-growing a start, and the industry continued to expand until it reached its greatest proportions in 1871. It then gradually diminished, and eventually went out of existence altogether about 1886. For a number of years Queensland produced no cotton at all.

This, continued Mr. Gillies, was not because of the fact—which need not be emphasised—that there were areas in the Queensland cotton belt which got only one good season out of four; nor was it due to any cotton control or anti-ratoon cotton legislation passed by the Government of that day. It was due to the fact that the price of the world's market did not pay the farmers for growing the crop, or something else paid better.

Mr. Gillies continued that this brought him to the main point which had been conveniently forgotten by those who favoured ratoon, and by those who were not prepared to give this Government credit for the statesmanlike action in guaranteeing for a term of years a payable price for all good quality cotton. It must be admitted, however, and the figures proved this, that the guarantee was responsible for reviving the cotton industry in Queensland.

Marketing Most Important.

The value of the crop in 1919, the first year of the guaranteed price by the Queensland Government, was £853, whereas this year, as the result of that guarantee, the crop was estimated to be worth half a million pounds sterling. The conditions of the guarantee, Mr. Gillies pointed out, thrust the sole responsibility of transporting, ginning, and marketing on the Queensland Government, and they owed it to the taxpayers to do everything possible to prevent a serious financial loss on the transaction, and any loss at all could be justified only if at the end of the term a new and important industry was firmly and soundly established. It naturally followed that the Queensland Government had to pay serious attention to the most important question of all, that of marketing, as previous experience had shown that there were millions of acres of idle land in Queensland capable of producing the best quality of cotton.

It became necessary, then, to find out all about the markets and to endeavour to secure the very best price for the Queensland growers, a price which would enable them to receive a reasonable reward for their labour and enable them at the same time to pay decent wages to those whom they employed to assist in clearing the land, cultivating the soil, and harvesting the crop. The Government had always believed that if they were to get the highest price, or a price that would permit of Australian conditions being complied with, they must produce the highest quality article.

Queensland's Cotton Reputation—A Vital Matter.

On the occasion of the visit of the Cotton Delegation, the members of which were, it must be admitted, qualified to speak on behalf of a large and important section of those who were expected to buy the bulk of our crop, the Government were strongly advised by those gentlemen not to permit ratoon cotton to be grown under any condition. Their opinion, as spinners and wholesale buyers, was supported by the best independent expert advice that the Government had been able to secure. In support of their arguments they had pointed to the legislation that had been passed in other parts of the world, and declared emphatically that ratoon lint was, generally speaking, inferior to that of annual cotton. They declared, amongst other things, that the ratoon lint was inferior in character in regard to strength, length, and uniformity of staple, and in nearly every case it was found to be shorter, weaker, harsher, and lighter of body, lacking twist or fibre. They also stated that the percentage of lint to seed was much lower in the case of ratoon, and that the cost of picking was generally greater. Mr. Crompton Wood had declared on behalf of the spinners that if it were known by them that ratooning was allowed it would injure the reputation of the whole pack, and thus prevent the highest price being obtained. This, of course, was a very vital matter for the Government, who had undertaken to guarantee the price.

The Pest and Disease Risk.

The Delegation had also warned us regarding the greater danger involved in growing ratoon in the matter of the spread of pests and diseases, because of the roots remaining in the ground providing a continuous harbourage for these pests.

Mr. Gillies said that he might here remark that he had never contended that pests were confined to ratoon cotton, nor that good ratoon cotton might not be, in some cases, better than bad annual cotton. Nor had he argued that, so far as the growing of the crop was concerned, it was not easier in many parts of the State to grow a crop of ratoon cotton as compared with annual.

Safety First.

Mr. Gillies continued that the Government, after giving the fullest consideration to the foregoing, had decided on the policy of safety first, and Parliament had passed the Cotton Industries Act, which placed an embargo on ratoon cotton. In his second-reading speech he had stated that experience might teach them that Australia was different from all other cotton-growing countries, and that it might be necessary at some future time to reopen the question. Meanwhile, he had given the House the promise that the Government would carry out exhaustive experiments and tests in the field, factory, and laboratory, and at the same time would fully investigate the possibility of securing a profitable market. All these promises were being honourably carried out in a manner that would be much more effective in arriving at any future decision than all the Royal Commissions that could be appointed. As a matter of fact, Governments were generally criticised for appointing Royal Commissions, and were accused of trying to side-step their responsibilities. The Queensland Government were not going to do that.

Exhaustive Tests and Experiments.

Field experiments at Melton and Monal Creek, in the Upper Burnett country, also on several farmer plots in the Burnett and Central districts, were being carried out, but the results for the year were not yet complete. Spinning and laboratory tests were being undertaken through the Agent-General, and ten bales of ratoon cotton had been sent to him for spinning, and for testing the market. Samples of annual Durango and ratoon were sent to the laboratory of the British Cotton Industry Research Association, and final reports were awaited.

Consideration at the Proper Time.

These investigations and the results of the marketing efforts would all be carefully considered by the Government at the proper time, and any action then considered necessary would be taken. The Government were not going to be stampeded by a section of the people, as they, together with the Commonwealth Government, now as a partner, had to take the full responsibility with regard to the successful marketing of the annual cotton output, which last year (and the figures should be exceeded this year) represented over 96 per cent. of the total crop.

A Statesmanlike Policy.

Mr. Gillies said he wished to emphasise that the revival of the cotton industry in Queensland was due in the first instance to the policy of the Government, and it was well to remember that the statesmanlike attitude of the Government in guaranteeing a minimum price that they believed would cover the cost of production and give the farmers a substantial profit, had resulted in a number of landowners making use of the land for the first time, and that it would have been much easier for the Government to have allowed this land to lie idle, as previous Governments had done. In this way they would have avoided a great deal of anxiety and a great amount of unfair criticism.

The result of the Government policy so far had been that £1,000,000 worth of new wealth had been created, and much idle land had been brought into profitable use.

Mr. Theodore, concluded Mr. Gillies, in the course of his stay in England, had no doubt been able to gather a great deal of valuable information on the ratoon question, and the results of his investigations and his advice would be at the disposal of the Government when they were considering the problem connected with the cotton industry.



PLATE 13.—TOMATOES PACKED AT POZIERES PACKING SHED,
1924 SEASON.

Packed in half dump cases.

GRAPE FRUIT.

The attention of the Department has been called by the Palmwoods, Montville, and Buderim Mountains Fruitgrowers' Association, to the quantity of "Poor Man's Oranges" and similar fruits that have been offered for sale under the name of grape fruit to the detriment of the sale of the latter. Anyone who purchases "Poor Man's Oranges" under the impression that he is getting grape fruit is apt to be very disappointed and form a very unfavourable impression of the latter fruit. The "Poor Man's Orange" is a type of thin-skinned seville or sour orange, having a very acid juice and only valuable for preserving purposes; whereas the grape fruit is a species of pomelo or shaddock, a totally different species of citrus fruit to the "Poor Man's Orange." The grape fruit obtains its name from its habit of producing its fruit in clusters. In appearance it resembles a large orange with a particularly smooth skin, being usually globular in form but sometimes pear-shaped. The pulp in most varieties is in colour pale yellow or greenish white, sometimes pink or crimson, and is distinguished from that of the orange by being composed of larger and distinct "sacks." The seeds, when present, are also very much larger. In United States of America the fruit is very popular, being eaten in the early morning as a dessert. According to the British Medical Journal it has a wholesome, clean, slightly bitter taste, blending with the acidity of the orange and has the physiological action of stimulating the appetite and promoting digestion. The range of varieties is not extensive. Foster's red flesh, Marsh seedless, Ruby and Triumph being included in the citrus products of this State and also what is termed "the genuine Japanese grape fruit, Natsumikan." This last-named variety should not be included as it savours more of a cross between the rough lemon and "Poor Man's Orange" and the principal features of the genuine grape fruit are absent.

ORANGE PACKING.

THE AUSTRALIAN BUSHEL CASE.

In order to determine the suitability of the Australian bushel case, commonly known as the "dump" case, the Committee of Direction of Fruit Marketing requested the Department of Agriculture to give this case a thorough test. It was therefore decided to use this case for the orange packing classes that are now being conducted in the North Coast fruit district. This case has been adopted by the orange-growers of Victoria, and by the apple and pear growers of Tasmania and the rest of the States, and may be considered as the standard bushel fruit case of the Commonwealth.

The inside measurements of the case are as follows:—Eighteen inches long by fourteen and a-quarter inches deep by eight and two-third inches wide, and its capacity is 2,223 cubic inches. Mr. Rowlands, the Departmental Fruit Marketing and Packing Instructor, has worked out the following five grades of oranges for this particular case:—

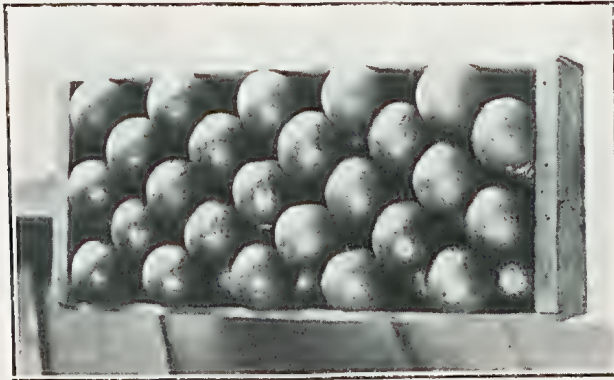


PLATE 14.—ORANGES. $2\frac{1}{4}$ INCHES IN DIAMETER.

Will contain eight layers of oranges, 25 oranges in each layer, making a total of 200 oranges for the case: 3-2 pack on side.

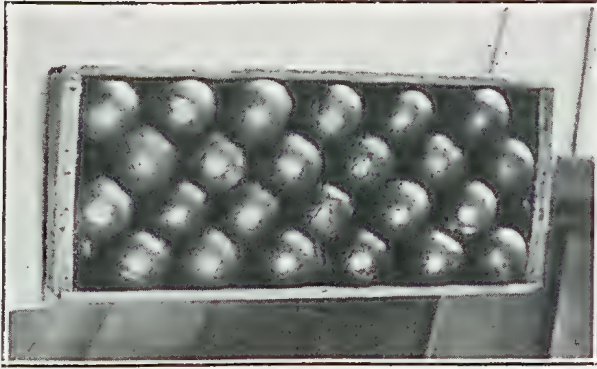


PLATE 15.—ORANGES $2\frac{1}{2}$ INCHES IN DIAMETER.

Will contain seven layers of oranges, 24 oranges in each layer, making a total of 168 oranges for the case; 2-2 pack on side.

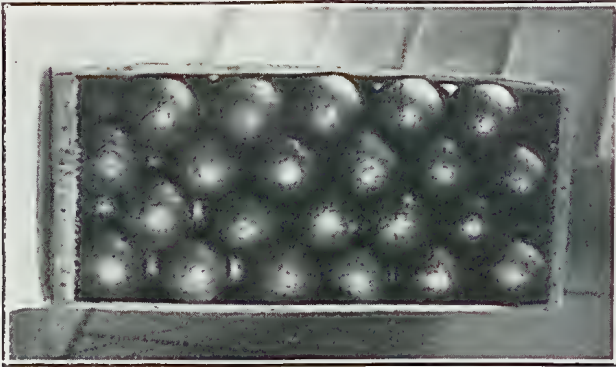


PLATE 16.—ORANGES $2\frac{3}{4}$ INCHES IN DIAMETER.

Will contain six layers of oranges, 22 oranges in each layer, making a total of 132 oranges for the case; 2-2 pack on side.

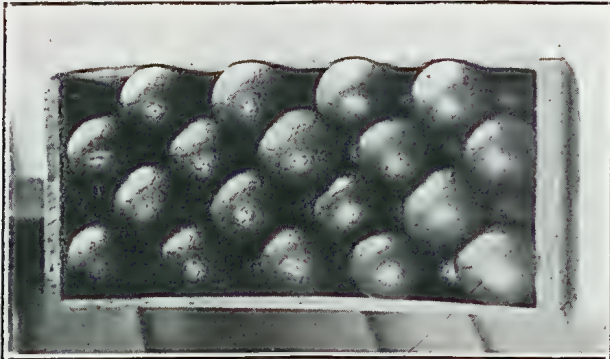


PLATE 17.—ORANGES 3 INCHES IN DIAMETER.

Will contain six layers of oranges, 18 oranges in each layer, making a total of 108 oranges for the case; 2-2 pack on side.

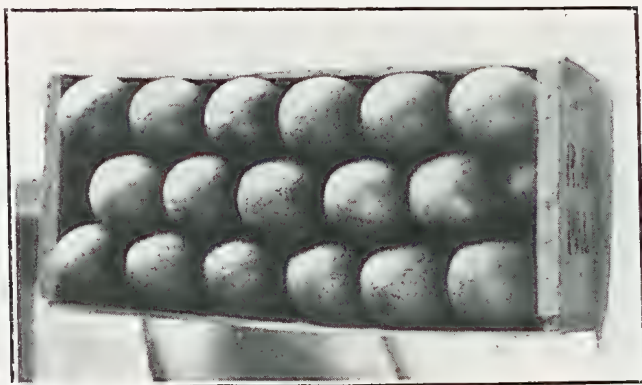


PLATE 18.—ORANGES $3\frac{1}{4}$ INCHES IN DIAMETER.

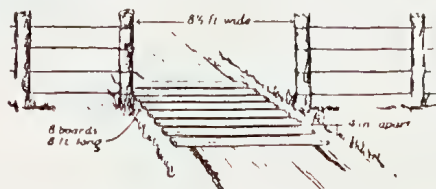
Will contain five layers of oranges in each case, the first, third, and fifth layers containing 17 oranges in each layer, and the second and third layers containing 16 oranges in each layer, making a total of 84 oranges for the case; 2-1 pack on edge.

If oranges are sized into five dimensions—namely, $2\frac{1}{4}$ -inch, $2\frac{1}{2}$ -inch, $2\frac{3}{4}$ -inch, 3-inch, and $3\frac{1}{4}$ -inch—they will meet all requirements for the trade. In determining the size of oranges they are measured from cheek and cheek, not from flower end to stem. When sizing is done by hand, rings or wooden gauges cut to the required sizes may be employed, not necessarily for every orange, but when the person sizing is in doubt. Oranges that drop through the $2\frac{1}{2}$ -inch ring and remain on the $2\frac{1}{4}$ -inch ring are $2\frac{1}{4}$; those remaining on the $2\frac{1}{4}$ -inch ring after passing through the $2\frac{3}{4}$ -inch ring are $2\frac{3}{4}$ -inch oranges; those passing through the 3-inch ring and remaining on the $2\frac{3}{4}$ -inch are $2\frac{3}{4}$ -inch oranges; oranges that pass through a $3\frac{1}{4}$ -inch ring and remain on the 3-inch ring are 3-inch; those that pass through a $3\frac{1}{4}$ -inch ring and remain on the $3\frac{1}{4}$ -inch ring are $3\frac{1}{4}$ -inch. Thus it will be seen that nearly a quarter of an inch variation is allowed. If one-size oranges are one-eighth of an inch under or over the dimensions above, it will, of course, make much difference in packing.

AN AUTOMOBILE GATE.

Here is a simple way to make an automobile gate that will let the cars through but keep the stock from passing.

Get eight 2 by 4's, 8 feet long, and sixteen stakes about a foot long. Wherever you want the gate, set two posts 8 feet apart and bring the fence to them, thus leaving an 8-foot gate opening.



A gate for cars but not for stock.

Dig a pit 5 feet square and 3 feet deep centred between the posts. Then take the 2 by 4's and lay them 4 inches apart over the pit, running lengthwise with the fence and stake them down at each end.

You now have a gate that is always ready for motor cars to pass, but stock will never try it, and you need not worry longer about your neighbours leaving your gates open.

AN EFFECTIVE PAINT FOR DAMP SURFACES.

In the course of the past season grading inspectors have reported numerous instances of mouldy butter. The cause of this mould has been generally attributed to faulty butter box timber; but, to the end that moulds may be combated, it is desirable that, in addition to attending to the matter of faulty box timber, all other contributing causes should be avoided.

Cold storage rooms are necessarily subjected to damp, in consequence of which moulds readily grow on walls and ceilings and are difficult to combat—when storage rooms are continually in use—owing to the decay of timber and the impossibility of successfully applying oil paints to the damp surfaces.

The difficulty of painting damp walls may, however, be overcome by using the dressing, the recipe for which is appended.

This paint may be used as a dressing over which ordinary paints may be applied, but in itself makes a paint which gives a white and very hard, bright enamel-like surface, and which will satisfactorily stick to a damp surface if properly applied.

As an instance of the efficacy of this paint, I may mention that the cold storage room at one of the factories in the district under my supervision was in a generally unwholesome condition owing to the paint having peeled from the damp timber beneath it, and in consequence of which a great deal of mould had formed. In the course of the winter of 1921, the manager of the factory, at my suggestion, had the room painted with the dressing described, one coat of which proved to be satisfactory, although it had been applied somewhat roughly, owing to painter being unused to the material. During the next winter, the manager having some material left over from the previous year, had another coat of the paint applied while hot. Since then nothing has been done to the paint with the exception of a wash down with water.

An inspection of the room made recently by me showed the paint to be in excellent condition and looking as if it had been newly applied, not the slightest peeling having occurred. The surface of the paint is very hard, and where mould forms on it it can be wiped away with a damp cloth as though from glass.

The only objection to the dressing is that, unless the room is well ventilated after painting, the smell of naphtha is somewhat objectionable for a few days, but does not last as long as does the smell of oil paint.

From the result of observations made by me, I can confidently recommend the paint, particulars of which are given below, for the interior of cold storage rooms.

Ingredients.

7 lb. zinc white paste paint; 14 lb. pale resin; $\frac{1}{4}$ gallon oak varnish; 2 quarts boiled linseed oil; and $1\frac{1}{2}$ gallons coal tar naphtha.

Instructions for Use.

Melt the resin in an iron pot over a fire, and then add the varnish and the boiled oil. Stir the mixture well, and allow it to cool to 100 deg. Fahr., and while constantly stirring add the naphtha. In another vessel break down the zinc white with a quarter of a gallon of the naphtha (previously put aside for the purpose) and then thin it down with the mixture already made.

The above makes an excellent white, but any colour can be got by adding the necessary colouring matter. It dries quickly with a hard, enamel-like surface.

The surface to be painted should be cleansed from old paint; and, when the interior of a cold room is being painted, the paint should be kept in a hot water bath; and, as naphtha evaporates freely, it should be thinned down when necessary with more naphtha.

Caution.

When dealing with naphtha or the mixed paint, keep from an open flame, as the naphtha is very inflammable, and when its vapour is mixed with air it is explosive.

Do not use white lead in making the paint, as it does not chemically combine with the other ingredients.—F. J. WATSON, Dairy Instructor.



PLATE 19.—SYSTEM OF INSPECTING QUEENSLAND ORANGES AT MELBOURNE.
100 per cent. Inspection should a Fly-Infested Fruit be found.



PLATE 20.—FIRST CITRUS PACKING CLASS, SEASON 1924, AT ST. ISIDORE'S
AGRICULTURAL COLLEGE, MAPLETON, BLACKALL RANGE.

ABSTRACTS AND REVIEWS.

All foreign agricultural intelligence in this section, unless otherwise stated, has been taken from "The International Review of the Science and Practice of Agriculture," published at Rome by the International Institute of Agriculture.

The Use of Artificial Smoke Clouds in Combating White Frosts.

CHASSANT, M., and CLARTE, R., Une expérience sur la lutte contre le gelées blanches par les nuages artificiels. "Annales de la Science agronomique," Year 40, No. 2, pp. 88-91. Paris, 1923.

On the occasion of the severe cold of 20th April, 1922, some experiments were carried out at Montpellier, artificial smoke-clouds being used to combat the frosts which were doing much injury to vegetation in general, and especially to the vineyards.

For the production of the smoke, some "engins fumigènes Berger" (Berger smoke generators) left over from the war were employed. These generators produce a dense, heavy smoke of metallic oxides.

The spot chosen for the tests was very suitable, being a small valley entirely surrounded by hills, so that the cold air accumulated there during the night.

At 2 o'clock on the morning of 20th April, when the thermometer had fallen to $+0.2$ deg. C., the fires were lit and all the bottom of the valley was soon filled with a dense stratum of smoke that prevented the cold masses of air from descending and also reduced the loss of heat by radiation from the ground. Throughout the whole area covered by the smoke there were no cases of injury, whereas in the zones immediately bordering on it, half the young buds were destroyed by the frost. Twelve generators were used.

Maturity Changes Taking Place in Refrigerated Pineapples.

HENRICKSON, H. C. "The Journal of the Board of Agriculture of British Guiana," Vol. XVI, No. 3, pp. 152-154, Demerara, 1923.

Report of observations made on pineapples after removal from the refrigerator. The changes in composition and colour according to variations in temperature were noted and the following deductions made:—(1) A temperature of 50-60 degrees F. will partly interfere with maturity changes. This applies also to fruit ripened on the plant, which if not affected with fungi will keep for a week without change, although for longer it is not dependable. Green fruit will not change colour perceptibly; (2) A temperature of 35-49 degrees F. prevents changes very effectively whether the fruit is either green or ripe. Green fruit will mature after removal from the refrigerator if kept there for only six days. If kept for a longer period, a normal change does not occur either in colour or in composition of the juice; (3) Pineapples can therefore be pre-cooled at a temperature as low as 35 degrees F. for a short period with satisfactory results. Well coloured fruit can be stored for a fairly long period at about 40 degrees F.

Considerable shrinkage was noticed in fruit stored at 50-60 degrees F. for three weeks, but the change was negligible when kept at 35-45 degrees F. Covering the fruit with melted paraffine was found to be successful in preventing shrinkage. The fruit was firmer and smoother for a much longer period than when left untreated. This method is, however, not recommended for green or bronze-coloured fruit as the paraffine hinders colour changes, but is suited for large sized plant-ripened fruit shipped under refrigeration. Such fruits are superior in quality to those picked before being coloured, and there is every opportunity to build up a market, a practice hitherto neglected.

The Efficient Utilisation of Maize.

"The South African Journal of Industries," Vol. VI, No. 12, pp. 605-608. Pretoria, 1923.

The article discusses the varieties of maize, grading, and areas of production in South Africa. The by-products are dealt with, such as starch, oil, press-cake, gluten-feed, glucose, dextrin, maltose, and dextrose. Attention is drawn to the importance of maize for human and live stock consumption, also for the production of industrial alcohol.

Cotton Variety Tests.

BRIGGS, C. "Experiment Station Record," Vol. 49, No. 5, p. 432. Washington, 1923.

The "Oklahoma Experiment Station Bulletin," No. 141, 1923, gives details of yield with estimated money values for about forty varieties, and selections of cotton which have been compared at the Station from 1916 to 1921 inclusive. Results for 1922 are included, with direction for growing cotton under boll-weevil conditions. Oklahoma 44 and Harbville No. 12 averaged highest in yield and value of seed and lint.

Mangrove Bark as Tanning Material.

"Commercial Bulletin, Government of Palestine," Vol. IV., No. 45, pp. 294-298. Jerusalem, 1923.

General survey of the sources of mangrove supply, manufacturing extract in the producing countries, export trade of the Dutch East Indies and Straits Settlements, and the industry in Africa and other countries. Reference is also made to the tannin content of the extract and the methods of blending with myrobalans, sumac, &c., employed in certain countries.

The Value of Molasses as a Fertiliser.

TEMPANY, H. A. (Director of Agriculture, Mauritius), and GIRARD, F. (Assistant Chemist), Bulletin No. 23, from "Louisiana Planter and Sugar Manufacturer," Vol. LXXI., No. 25, p. 487. New Orleans, 1923.

The planters of Mauritius are practically unanimous as to the beneficial results of the application of molasses to cane fields. In plant canes it is applied in the holes some weeks before planting or between the young growing cane; to ratoon crops it is applied either around the stools or between the rows. The usual quantity is about 4 tons per acre, although as much as 15 tons are sometimes applied.

The general practice in Mauritius is a cycle of one crop of plant cane and five crops of ratoon, and the gain in yield attributed to the application of molasses is estimated to amount to a total increase of 20 tons of cane per acre. Experiments indicate that the increase in yield from plant cane amounts to 9 or 10 tons per acre. This increase can hardly be attributed to the added plant food material conveyed by the molasses to the soil, and it is suggested that the cause of increase is probably biological in nature.

The Utilisation of Bagasse

"Scientific American," Year 79, p. 241. New York, October, 1923.

The use of paper as a surface "mulch" has been suggested in connection with various crops. The Hawaiian sugar planters are utilising their waste bagasse for the manufacture of paper, which is used in the fields, being laid in strips over the rows of young cane. As the cane grows it penetrates the paper, the growth of the plant not being hindered in any way. On the other hand, weeds have not sufficient sharpness or stiffness to penetrate the paper and are, in consequence, completely eliminated.

Cost of Upkeep of Six-horse-team Unit in New Zealand.

FAWCETT, E. J. (Asst. Instr. Ag. Christchurch), "New Zealand Journal of Agriculture," pp. 355-364, Table 8, Vol. XXVII., No. 6.

In undertaking this work the author's idea was, largely, to suggest to farmers the great importance to themselves of an exhaustive inquiry into the costs of raising farm produce. In investigating, the points kept in view were:—(1) Cost of maintaining a six-horse team for one year; (2) cost of cultural operations per acre, calculated at 150, 175, 200, 225, and 275 working days per annum. Twenty-seven farms were selected and visited personally to obtain the required information, and from the data gathered it was shown that the average cost of upkeep of six horses and equipment is £548 5s. 8d. per annum, or £592 9s. 8d. for seven horses and equipment.

The power unit is the most expensive item on the farm, and bad management of the team alone will cause a debit balance, as every day the team is idle the cost to the farmer is nearly £2, for which there is no return.

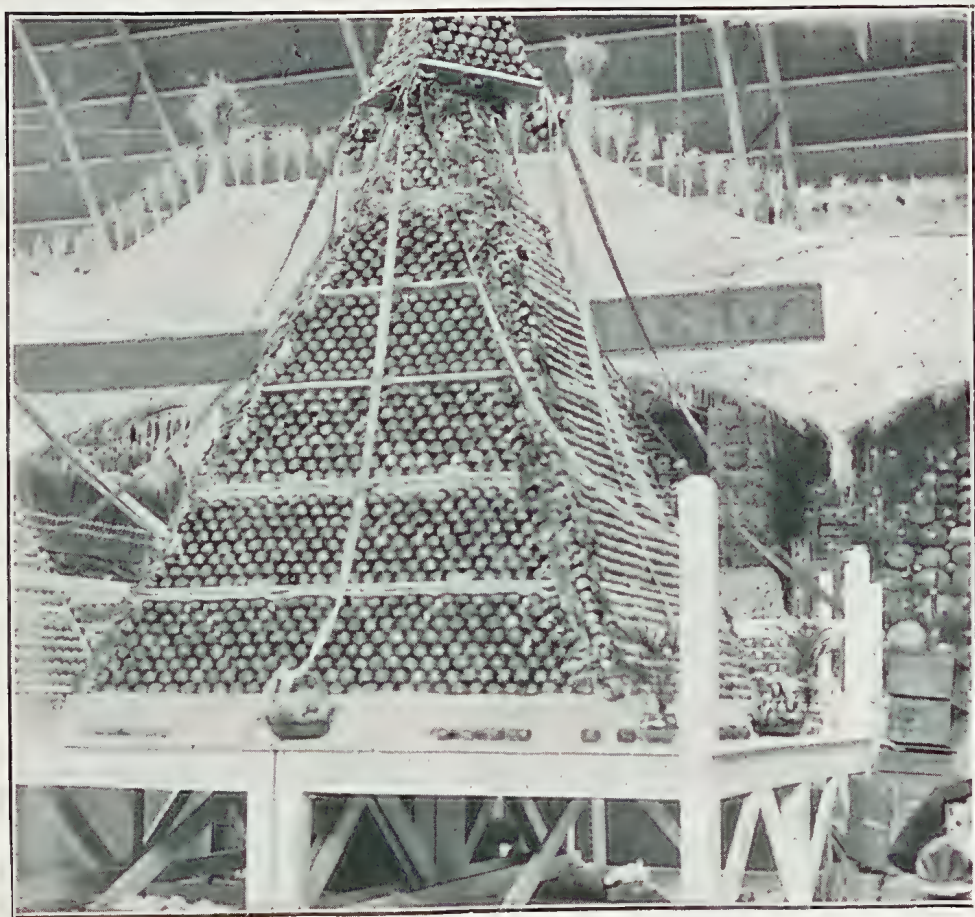
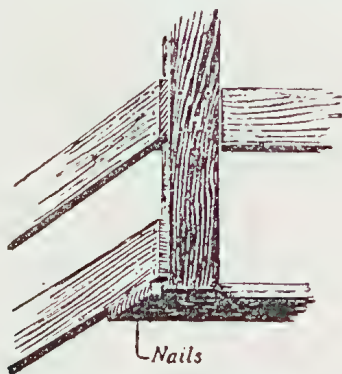


PLATE 21.—THE WINNING FRUIT EXHIBIT, SYDNEY ROYAL SHOW, 1924.
The Tasmanian Trophy, awarded First Prize with 85 points.

STRENGTHENING CRATES.

Crates for shipping livestock or other farm products should be made quite strong to prevent breakage in shipping. Much of the weakness in crates is at the



Strong corners prevent breakage in transit.

corners. If the corners of the crates are made like the corner shown in the illustration much breakage will be avoided. This corner is the strongest corner it is possible to make. Neither of the three pieces may be pulled loose without breaking.

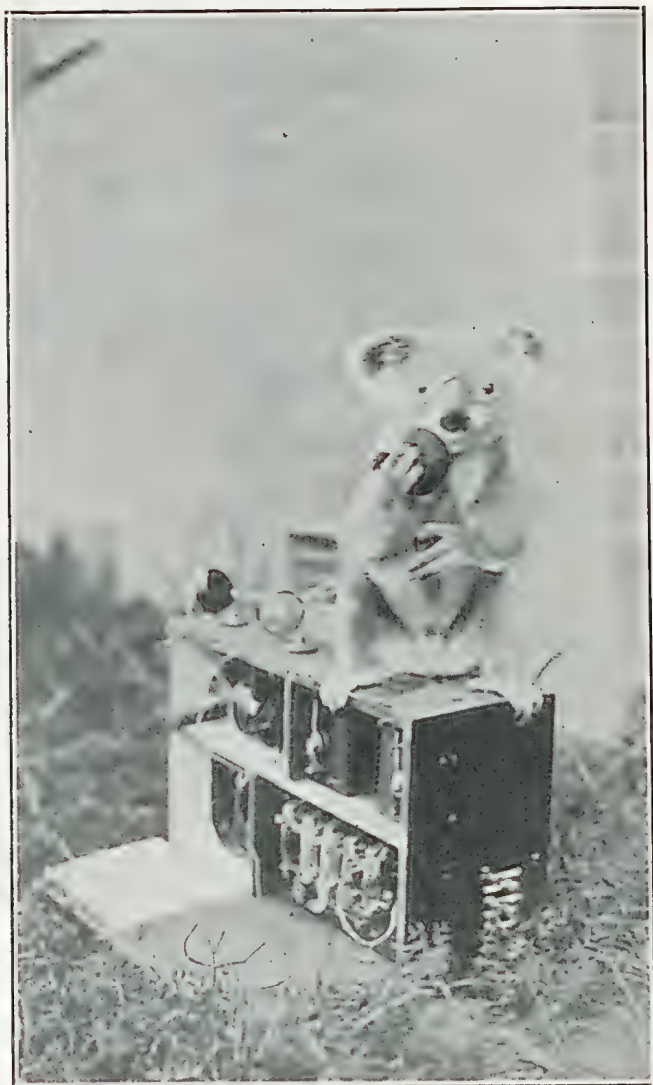


Photo: Geo. Porter.]

PLATE 22.—A FRIEND OF THE FAMILY.

The Koala or Native Bear is now entirely protected in Queensland.

RATOONING.

In Egypt and some other countries where the boll worm is rife it has been found necessary to introduce legislation prohibiting ratooning and enforcing the destruction of old crops by a given date.

Such measures were absolutely essential. After many years of slovenly methods, coupled with indifference to the advice offered by scientists, the very existence of the cotton growing industry was threatened, and nothing but drastic action by the Governments could save it.

It is obvious, of course, that where ratooning is practised the most important preventive measures against insect pests cannot be as thoroughly carried out as is possible where cotton is an *annual* crop. Growers who are obliged to ratoon, therefore, must concentrate on those operations that can be carried out; they should cut down their plants as early as is consistent with the welfare of the crop and see to it that no cuttings, leaves, or plant refuse of any kind are left on the land. Common sense is much better than legislation.—C. B. SYMES, Entomologist, in the "Rhodesian Agricultural Journal" for April.

General Notes.

Our Foreign Trade.

A study of our foreign trade figures supplied by the Commonwealth Bureau of Census and Statistics, show that for the year ending 30th June, 1923, Australia purchased from America goods value £24,000,000, and sold only to America goods value £9,000,000. Therefore, the trade balance in favour of America was £15,000,000, or equal to Australia buying 166 per cent. more from America than she sold to America.

For the same year ending 30th June, 1923, Australia purchased from Great Britain goods value £68,000,000, and sold only to Great Britain goods value £51,000,000. Therefore, the trade balance in favour of Great Britain was £17,000,000, or equal to Australia buying from Great Britain, 33 per cent. more than she sold to Great Britain.

For the first six months of the current year ending 30th June, 1924, Australia purchased from America goods value £16,000,000, or equal to £32,000,000 for the full year. Figures are not yet available for Australia's sales to America for the above period and allowing for a liberal increase of 10 per cent., the figures should be, say, £10,000,000. Therefore, the trade balance in favour of America for the year ending 30th June, 1924, will probably be £22,000,000, or equal to Australia buying from America 220 per cent. more than she sold to America.

For the first six months of the current year ending 30th June, 1924, Australia purchased from Great Britain goods value £32,000,000, or equal to £64,000,000 for the full year. Figures are not yet available for Australia's sales to Great Britain for the above period and without allowing for any increased sales, take last year's sales, viz., £51,000,000 as a basis. Therefore, the trade balance for the year ending 30th June, 1924, should be, say, £13,000,000, or equal to Australia buying from Great Britain 25 per cent. more than she sold to Great Britain.

Atherton Maize Board.

The result of the recent election of growers' representatives on the Atherton Tableland Maize Board:—

*H. H. Collins (Atherton)	235	votes
*J. P. McCarthy (Tolga)	198	"
G. W. Roseblade (Yungaburra)	163	"
J. J. McDonald (Tolga)	155	"
*H. J. Armstrong, junr (Atherton)	146	"
T. D. McGeehan (Kairi)	137	"
J. Gargan (Kairi)	137	"
P. G. Martin (Kairi)	123	"
G. H. Henning (Kairi)	98	"
R. Hill (Atherton)	80	"
Informal	7	"

*Denotes Sitting Members.

Messrs. Collins, McCarthy, and Roseblade will accordingly hold office until 31st March, 1926; and Messrs. McDonald and Armstrong until 31st March, 1925. The Board will also include a representative of the Council of Agriculture.

Atherton Pig Board.

The result of the recent election of growers' representatives on the Atherton Tableland Pig Board:—

*R. Campbell (Pearamon)	215	votes
G. A. Duffy (Yungaburra)	209	"
H. H. Collins (Atherton)	197	"
*G. W. Roseblade (Yungaburra)	184	"
*G. R. Davidson (Pearamon)	175	"
F. T. Smith (Tolga)	128	"
D. Macpherson (Tolga)	104	"
R. Hill (Atherton)	98	"
Informal	2	"

*Denotes Sitting Members.

Messrs. Campbell, Duffy, Collins, Roseblade, and Davidson will accordingly hold office on the Board from 1st July, 1924 to 30th June, 1925. The Board will also include a representative of the Council of Agriculture.

The Committee of Fruit Marketing.

An Order in Council has been promulgated under the Fruit Marketing Organisation Act constituting the first Committee of Direction under that Act as follows for twelve months from the 12th June, 1924:—

Representatives of Fruitgrowers elected by the Banana Sectional Group Committee—

William Alexander Catheart, Landsborough.
William Bede Christie, Currumbin.

Representatives of Fruitgrowers elected by the Pineapple Sectional Group Committee—

Joseph James Thomas, Montville.
William Chataway, Cleveland.

Representatives of Fruitgrowers elected by the Citrus Sectional Group Committee—

Leslie Garforth Swain, Flaxton, *via* Palmwoods.
James Collins, Redland Bay.

Representatives of Fruitgrowers elected by the Deciduous Section Group Committee—

Jack Stephen Mehan, Broadwater, Stanthorpe.
David Pfrunder, Applethorpe.

Representatives of Fruitgrowers elected by the Sectional Group Committee for Other Fruits—

Clement Charles Boulter, Bowen.

Nominee of the Council of Agriculture—

Leslie Richmond Macgregor, Brisbane.

The Order in Council further provides that the Committee shall have powers and functions as set out in the Act; and also for convenience in administration, and in order to carry out the objects and purposes of the Act the property in and to all Queensland fruit shall be from the 12th June, 1924, vested in the Committee of Direction. Any person who obstructs or impedes the Committee in exercising any of the functions, powers, authorities, duties, and responsibilities vested in it by the Act shall be subject to a penalty not exceeding £50.

Staff Changes and Appointments.

Mr. M. J. Keating, of the Customs Department, Maryborough, has been appointed an Inspector under and for the purposes of the Diseases in Plants Act, *vice* Mr. V. B. Mycock, who has been transferred from Maryborough.

Mr. C. C. A. Hansen, of Maryborough, has been appointed Clerk on Probation, Advances to Settlers Branch, State Advances Corporation.

Messrs. J. E. O'Reilly, Wm. Clacher, and M. Wall have been appointed Assistants to Cane Testers at Moreton, Farleigh, and Millaquin Sugar Mills respectively.

Mr. D. D. Lehane has been appointed Millowners' Representative on the Invieta Local Sugar Cane Prices Board, *vice* Mr. C. E. Eldred, resigned.

Misses A. L. Levy, N. Walsh, and F. Parkinson, and Messrs. V. Martin, R. H. Slean, and W. Richardson have been appointed Assistants to Cane Testers at Maryborough, Bingera, Proserpine, Plane Creek, Marian, and Pleystowe Mills respectively, for the forthcoming sugar season.

The resignation of Mr. O. L. Hassell as Agricultural Field Assistant, Department of Agriculture and Stock, has been accepted as from the 24th July, 1924.

Mr. J. C. Lee, Bluff Station, Birdsville, has been elected a Member of the Diamantina Dingo Board, *vice* Mr. A. J. Edwards, of Glengyle Station, resigned.

Citrus Scab.

The scab of citrus, *Cladosporium citri*, Massee (*Ramularia scabiosa*, McAlpine and Tryon), has been proclaimed a disease within the meaning of "The Diseases in Plants Act of 1916."

The Queensland Co-operative Bacon Company.

In accordance with the provisions of "The Primary Producers' Co-operative Associations Act of 1923," the Queensland Co-operative Bacon Company Limited, at Murarie, has been declared to be a company carrying on operations of a co-operative nature in relation to primary produce.

Arrowroot Levy.

In order to recoup members of the Arrowroot Board for their travelling expenses and fees for attending meetings, a levy not exceeding in any year 4d. per ton of arrowroot bulbs grown, will be made upon all growers of arrowroot within Queensland.

Co-operative Trading.

The Governor has now approved of the acquiring and carrying on of supply stores for the purpose of trading in general merchandise as an object for which a Primary Producers' Co-operative Association may be formed under "*The Primary Producers' Co-operative Associations Act of 1923.*"

Banana Rust.

The disease affecting bananas, known as "Banana Rust," "Banana Scab," or by the name of the insect causing it and known as "Banana Thrips" (*Euthrips* sp. Tryon), has been proclaimed to be a disease within the meaning of "*The Diseases in Plants Act of 1916.*"

The Minister for Agriculture (Hon. W. N. Gillies) has announced that this affection of the banana is by no means new to this State, as it was known to be present in banana gardens near Cairns as long ago as 1897. The Chinese, who were the principal growers of bananas in North Queensland at that time, did not consider it a serious menace to the industry as the damage caused thereby was only seasonal or sporadic. In recent years the affection has become more marked, especially in the Yeppoon and Pinalba districts, and it has now spread to the Gympie and Tweed River district in New South Wales, and will probably spread to other banana-growing districts in Southern Queensland.

"Rust" or "scab" in bananas is caused by a minute insect "thrips," a species of *Euthrips*, which lives by sucking the young, tender, succulent growths of the banana plant, and attacks the young fruit as soon as the bunch makes its appearance. In some instances the thrips are present in enormous numbers when they so injure the skin of the young fruit, by puncturing it with their sucking organs or by slitting it by means of the two saw-edged plates with which they prepare a cavity in which to lay an egg, that a chemical change takes place in the skin which turns it eventually a reddish or reddish-brown colour; in addition to which cracks or fissures more or less numerous make their appearance and produce scab-like markings on the fruit, rendering it unsightly and difficult to dispose of.

Banana rust is very prevalent in Fiji, and in order to prevent loss it is necessary to systematically fight it in every plantation in the islands. The method of treatment is briefly as follows:—As soon as the young bunch has emerged from the parent plant and hangs down, the bracts covering each hand of the bunch are removed by giving them a special hand-twist which detaches the bract without injuring the fruit. When this is done the whole of the fruit on the bunch is dusted with a mixture of finely ground pyrethrum roseum powder one part by measure and finely sifted dry wood ashes two parts by measure, applied by means of a rubber powder gun of about 8 ounces capacity. Care must be taken to carry out the work within three days of the bunch making its appearance, and to see that every part of the bunch is treated. When thoroughly and properly carried out one application of the mixture is usually enough, but in some cases a second treatment may be necessary.

Tall-growing varieties of bananas are treated in a similar manner, a light ladder being used to enable the operator to reach the bunch. The disease can be transferred from place to place by means of affected suckers or plants, in addition to which the mature thrips, both male and female, have wings and are able to fly some distance. In order to deal effectively with the thrips which are the cause of the trouble, "Banana Rust," "Banana Scab," or the insects causing same, *Euthrips* sp., is proclaimed a disease under the Diseases in Plants Act and special regulations are being drafted to give effect thereto.

Meanwhile, all banana growers are warned that the Diseases in Plants Act and the regulations thereunder provide that no person shall remove or cause to be removed any plant, &c., contrary to the Act, or sell or offer for sale any plant, &c., infested by or infected with any disease, the penalty for doing so in each case being a fine not exceeding £20.

"Banana Rust," "Banana Scab," or *Euthrips* having been proclaimed a disease under the Act, and any banana grower who removes, permits the removal of, sells, offers for sale or otherwise disposes of any banana plants or portions thereof, that are either infested by or infected with this disease, will render himself liable to prosecution.

Co-operative Associations Act—New Regulations.

Three additional regulations have been made under "*The Primary Producers' Co-operative Associations Act of 1923.*" Regulation 60 provides that any company registered under any other Act and desiring to become registered under the Primary Producers' Co-operative Associations Act, may, at the meeting provided for under the last-mentioned Act, alter its constitution and rules to entitle it to become registered as an association under the Primary Producers' Co-operative Associations Act. Regulation 61 sets out that a company, as mentioned in Regulation 60, shall be registered as an association under the Act, provided that its rules provide that at least two-thirds of the number of shares and voting powers of the association are always held by persons who are producers and suppliers to the association of the produce in respect of which the business of the association is to be carried on, and that each member of the association will be entitled to give one vote only at any meeting of the association; while Regulation 62 provides that a company, as above set out, may, in its rules, provide for the admission to membership in its proposed association, of members who are not producers as mentioned above, provided that such members shall not hold more than $33\frac{1}{3}$ per cent. of the shares or voting strength of the proposed association.

Cheese Board.

As no petition has been received by the Minister for Agriculture (Hon. W. N. Gillies), asking for a poll on the question of the extension of the Cheese Board term to the 30th June, 1927, an Order in Council has now been approved, declaring that Cheese shall be a commodity under and for the purposes of the Primary Products Pools Acts, from the 1st July, 1924, until the 30th June, 1927. In the Order in Council provision is made whereby the existing agents may continue their cheese marketing operations under the direction of the Board until a date to be notified in the "Government Gazette." Until that date, on Monday in every week, every producer shall deliver to the Board a return showing the total quantities of cheese manufactured by him during the preceding seven days, the names and addresses of consignees, and the respective quantities of cheese delivered. An agent for the sale of cheese shall lodge a similar return in respect to cheese sold or agreed to be sold by him in the course of the preceding seven days. Provision is also made for the internal adjustment by the Board of sales of cheese by producers and their agents. The Minister may from time to time call for an inspection of books and other documents of any producer or agent of a producer, for the purpose of ascertaining or verifying any of the particulars prescribed to be included in any return. Provision is also made for the licensing of agents or dealers in cheese.

The Board will have full control for regulating the delivery of cheese and the relative prices according to grade. Those entitled to vote at any referendum after the 1st July, 1924, shall be persons or company representatives who, at any time in the course of the six months immediately prior to the date of such referendum, produced cheese for sale, and dairy farmers who, in the course of the prescribed period, supplied milk to a cheese factory. Nominations for membership on the Board have already been received. The Board will consist of five elected members and one representative of the Council of Agriculture. Following are the nominations:—

Henry Thomas Anderson, Biddeston, *viâ* Oakey;
 Robert Goodwin, Byrnestown;
 Mads Peter Hansen, Malling, *viâ* Maclagan;
 Henry Keefer, Pittsworth;
 John Lipp, Greenmount East;
 James McRobert, Tiara, *viâ* Maryborough;
 David Gabriel O'Shea, Southbrook;
 William Smith, Yangan; and
 Albert George Tilley, Rosehill, *viâ* Warwick.

The necessary ballot-papers have been posted to all electors who number about 1,300. The ballot-papers must be returned to the Under Secretary, Department of Agriculture and Stock, not later than the 25th July, 1924.

Teat Wounds.

It sometimes happens that teats become torn on barbed wire or other sharp instruments, and little attention is given to the wounds. The commonest error in farm treatment of teat laceration is, perhaps, neglect to perfectly cleanse the wound before applying medicines. It is absolutely necessary, for perfect healing, that every bit of foreign matter be removed from the wound. To that end it is good practice to immerse the teat in hot water containing all the boric acid it will dissolve, and

at the same time to cut off shreds of skin or flesh, and pick out or wash out all grit, straw, manure, or other irritating substances which have fouled the part. If the cavity of the teat has not been opened the treatment will be a comparatively simple matter, and healing should be speedy, but it is a much more serious matter when a fistulous wound has occurred. It will usually suffice, after the thorough cleansing and disinfecting, to dust the wound with iodoform and boric acid, or wet it often with a lotion composed of 1 oz. of acetate of lead and 6 drachms of sulphate of zinc in a pint of soft water. This lotion should be labelled "poison," and well shaken before use. Another good plan is to paint the disinfected wound with iodoform-collodion, and then apply a thin layer of sterilised cotton, or, if preferred, a little cotton can be applied and kept in place by means of surgeons' tape. It is important after treatment to keep the cow in a clean box stall for a few days, and to draw off the milk by means of a milking tube that has been cleaned, boiled for fifteen or twenty minutes, and then smeared with carbolised vaseline before insertion in the teat. Unless carefully sterilised each time before insertion a milking tube will be certain to infect the teat and cause destructive mammitis.

Chapped or sore teats are often a trouble to the milker and the cow, and from a small injury or sore, garget may set in. A cold wind or teat left wet or even a very vigorous calf may be the cause of the injury which calls for immediate attention to prevent more serious trouble. A simple plan is to immerse the teat in the chosen medicant in a wide-mouthed bottle or jam pot. More than the quantity required for one application should be made up, and kept in reserve for filling the bottle. For chapped or bitten or externally damaged teats such a lotion as the following will serve:—Alum, 20 gr.; boracic acid, 4 dr.; glycerine, 6 dr.; and water, 1 pint. Dissolve in the water while hot, and bathe at tepid.—"The Farmers' Gazette."

Berkshire and Yorkshire Society of Australasia—Queensland Branch.

Pig raisers are reminded that the Annual Meeting of the abovementioned Society will be held at Affleck House, Brisbane Exhibition Grounds, on Wednesday, 13th August, at 10 a.m. Pig breeders, whether members of the Society or not, are invited to attend this meeting, when matters of general interest to the industry as well as Society matters will be discussed. The Secretary of the Queensland Branch, Mr. R. G. Watson, of Inns of Court, Adelaide street, Brisbane, will be pleased to supply any information required in respect to this meeting or to the advantages and privileges of membership of this Society. The Herd Books of the parent Society, which is now controlled by a Federal General Council, with branches in the various States, covers both Berkshire and Yorkshire breeds as well as for Tamworths, Poland-Chinas, and Duroc-Jerseys, or any other recognised pure breed of pig. Special interest centres in the Annual Meeting this year, for an effort is being made to push the interest of the Society in this State and to induce more pig breeders to join up. At the Show pig breeders should take the opportunity of familiarising themselves with the benefits of the Society and of carefully studying the various breeds of pigs that will be exhibited in the pig section. The Instructor in Pig Raising (Mr. E. J. Shelton), Department of Agriculture and Stock, held the position of Secretary of the New South Wales Branch before coming to Queensland. Mr. Watson's Show Ground Office will be at the Pig Section.

Working Dairy Farmers' Herds—Improved Butter Yields—New I.M.S. Record.

The secretary of the Herd Book Societies (Mr. R. S. Maynard) writes:—The month of June has seen some more excellent butterfat yields by Queensland cows. A new Illawarra Milking Shorthorn record has been established by Mr. W. M. Krause, of Lanefield, a breeder who entered the stud business recently. What the breed societies desire to emphasise in connection with the 273-day tests, carried out on their behalf by the Department of Agriculture, is that the good performances are not put up by one or two herds. Many of the best yields have been made by cows in small herds, in herds belonging to beginners in the stud business. It is only a few months ago, for instance, that Mr. W. M. Krause put up a record with his cow, Gentle IV. of Greyleigh, which made 491.56 lb. of fat, as a yearling. This was Mr. Krause's first effort at record-breaking. And now he comes along with Jennie IV. of Greyleigh, which has put up a performance of 505.97 lb. of butter fat in 273 days, as a senior two-year-old. This cow was two years and ten months old at the commencement of her test. This is not a record against all breeds, as Messrs. Brown Bros., with their Friesian heifer, Kornucopia Doral Wayne II., put up 565.88 lb. of fat last year, when a two-year old.

Mr. Krause put through a still younger heifer, Pollie of Allawah, which yielded 430.02 lb. of fat. She started her test at two years seven months old.

At Wangalpong, on the Canungra line, Mr. A. J. Caswell has just completed some tests of two-year-old heifers with results which, while they are not as high as

those achieved by Mr. Krause, are very good indeed. His Whinflower of Dnalwon yielded 364.69 lb. of butter fat, starting her test at two years three months. His Picture III. of Greyleigh, starting at two years five months, yielded 361.77 lb. of fat, while his Laura III. of Greyleigh, starting at two years seven months, yielded 362.97 lb. of fat.

Away up at Coalstoun Lakes, in the Biggenden district, Mr. J. T. Radel has completed a test of his cow, Dons Primrose, which has yielded 486.04 lb. of fat. His Queenie II. of Happy Valley, an aged cow, has yielded 540.79 lb. of fat, and his Queenie III. of Happy Valley has yielded 388.61 lb. of fat.

Mr. S. Mitchell, inspector of the I.M.S. Society, who has a very fine herd at Warwick, on the Darling Downs, has completed the testing of Model of Rosenthal. She is an aged cow. Starting her test on 1st March, 1922, she yielded, in 273 days, 496.24 lb. of fat.

On the Wondai tableland, at Murgon, Mr. John Bischoff has tested a cow, Vesta II. of The Cedars, bred by Mr. Elliott, of Boonah. She was five years old at the beginning of her test, and yielded 487.90 lb. of fat.

At Radford, on the Boonah line, Messrs. Macfarlane Brothers have finished the testing of Gentle 7th of Kilbirnie, which gave 353.14 lb. of butter fat, at two years five months old. Their Sweet Nell of Darbalara, starting her test at three years eleven months, has made 371.58 lb. of fat, and their Remembrance 9th of Kilbirnie, starting at two years eleven months, has made 393.39 lb. of fat.

All of these yields, of course, were for the 273 days' period.

In the Ayrshire breed a fine performance has been put up by Messrs. Anderson Bros.' Juliette of Fairview, a six-year-old cow, bred in their stud at Southbrook, Q. From 15,778 lb. of milk she produced 640 lb. of butter fat in 273 days. We have some excellent Ayrshire strains in Queensland, and the wonder is that more dairymen do not appreciate their producing capacity.

Amongst the Friesians, the best performances for the month was that made by Mr. George Newman's Belle II. of Friesland, which, from 17,974 lb. of milk, made 691.45 lb. of butter fat. Belle II. was eight years old at the time of commencing her test. She was imported from New Zealand by Mr. Newman.

Mr. P. H. Summerville, a young breeder of Friesian cattle, of Boyland, Canungra line, has completed the testing of his Colantha Brooklands Johanna, which has put up a yield of 446.93 lb. of fat as a two-year-old.

The finest performance of all was that put up by Messrs. J. Duffield and Sons' Talgai Creole, which eclipsed her previous excellent record by making 697.36 lb. of butter fat in her lactation period. This is equal to a yield of 820 lb. of butter, calculated at 85 per cent., or 871.7 lb. worked out on the basis of 80 per cent. butter fat.

As I pointed out when I had the pleasure of publishing the previous fine performances in the Duffield herd, these records are established under conditions which may be observed on almost any Queensland farm. The cows have been Queensland-bred for some generations, and they are fed on rations which, for the most part, are home-grown.

Many other tests were completed in June, but these which I have quoted show the best results. They should be an inspiration to every dairy farmer, and an incentive to him to breed the class of cattle that will yield as these cows yielded. As I have said, all these cows belong to working dairy farmers. They are not the property of fanciers.

The Demands of General Farming.

Whatever may or may not be done by Government, it is perfectly clear that the success of the individual farmer will depend on his own efforts. That he must work hard goes without saying, but under present conditions it must be work with the head as well as the hands. The crops to be grown and the kind of farming to be followed must be determined, not alone with an understanding of the conditions which influence production, but with some knowledge of the prospective demand for those crops and some study of the conditions which are likely to influence the price.—From the Report of the United States Secretary of Agriculture.

"What agriculture requires is a stimulus to fight its own battle. I was talking to an eminent agriculturist only the other day and a remark he made to me was this: 'If we could get all our agriculturists to farm as efficiently as the 20 or 25 per cent. at the top there would be very few agricultural problems in this country.'"—RAMSAY MACDONALD, in a recent statement in the House of Commons.

Farming for a Dry Year.

Since crops are more valuable per unit to the farmer in poor seasons, it is sound business to make a special effort to grow as good ones as possible in the off years. Consider what it means to buy seed and feed when seed is scarce, when hay prices go soaring in cyclonic gyrations, and when even a pile of wheat straw becomes an object of envy. . . . Few farmers are able to tide over comfortably a period of failure. It generally means borrowing, and this too often proves a slip noose. . . .

There must, of course, be reason in all things. It does not do to become obsessed with any single idea—even so important a one as moisture. Other things have to be considered; and then, too, one cannot afford to practise garden culture in growing 60-cent wheat. But observation convinces us that many a western farmer would be better off to put his time on fewer acres and farm for surer results.—W. D. ALBRIGHT, in "Seasonable Hints," Canadian Department of Agriculture.

The Value of Egg-Laying Competitions.

Whatever might be charged against egg-laying competitions, there is no question that they have been a great stimulus to specialised poultry-farming. To this factor we owe, in a great measure, the existence to-day of an industry worth nearly £3,000,000 per annum, which is sustaining at least 2,000 poultry-farmers and their families who have no other source of income. In addition, there are those who run poultry as a side-line, many of whom make a certain amount of income from the industry.

There are those who will opine that poultry is essentially a side-line proposition. This was the old idea, but what, it might be asked, was the progress made during that régime? Our figures will speak for themselves as regards volume, but there is another side to the question—was this side-line business really profitable? I am afraid that in most cases the glamour of income from hens was not properly balanced against the food consumed off the farm, and that in very many cases the income obtained from poultry was really obtained at a loss. At the present time no one need remain in ignorance of the cost of production as far as feeding is concerned.

Specialised poultry-farming, like the factory system in other industries, has come to stay, and poultry-farming under the new conditions must pay or the industry must die.—"Agricultural Gazette of New South Wales" for May.

Sulphate of Ammonia—Efficient Manurial Constituent.

The efficiency of sulphate of ammonia as a constituent in mixed potato fertilisers has been demonstrated in some experiments conducted near Carcoar (New South Wales), where Mr. B. Meek is working in co-operation with the New South Wales Department of Agriculture. The mixed fertiliser with the highest yield is officially designated "P. 3.", and contains ten parts of super-phosphate, three parts of sulphate of potash, and three parts of sulphate of ammonia. Application was at the rate of 4 cwt. per acre. The yield obtained was 9 tons 9½ cwt. (13 cwt. better than the next best, which was not a complete manure, lacking sulphate of ammonia, and nearly 3 tons better than the no-manure check plot.) For the benefit of Victorian potato-growers it might be pointed out that a mixture on the lines of "P. 3." can be put up by mixing the following quantities of the constituents mentioned:—12½ cwt. super., 3¼ cwt. potash, 3¼ cwt. sulp. ammonia. For those to whom home mixing does appeal, it might be mentioned that the fertiliser trade in Victoria puts up a very good standard complete manure, analysing as follows:—11.40 per cent. phosphoric acid, 7.05 per cent. potash, 2.50 per cent. nitrogen, as sulphate of ammonia, under the name of No. 1 Complete Manure. Excellent results have attended the use of this fertiliser over a wide range of soils.

International Refrigeration Congress.

At the final session of the International Refrigeration Congress resolutions were passed favouring the standardisation of international units of cold, and an international agreement on the specification of refrigerating capacity. Other motions urged the Governments of producing countries to introduce legislation standardising the methods of inspection of refrigerated produce intended for overseas; that certificates granted by the Governments of producing countries should be accepted as final in consuming countries; and that the inspection of frozen produce on arrival in consuming countries should be confined to that necessary to ensure that the produce was in good marketable condition.

Export Butter and Cheese Classes, Brisbane Show.

The entries received for the export butter classes at the Royal National Association's Show, to be held at Brisbane next month, are considerably more than last year's figures. It is expected that the other classes which close at a later date will constitute a record.

This year's export cheese classes will evoke more than ordinary interest by reason of the fact that the entrants consist of interstate competitors. The total entry received for the above classes number 46, as against 11 last year, whilst the 1922 figures have been more than doubled.

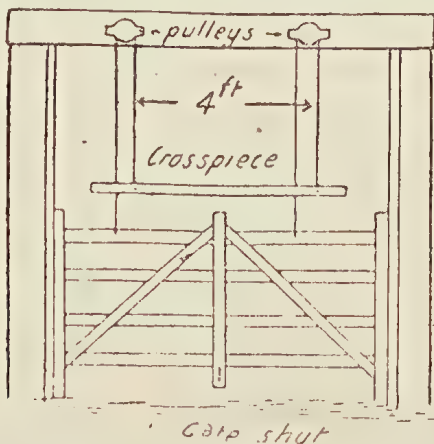
Sparrows' Good Work.

Some years ago the imported plant *sida retusa* grew upon every unoccupied allotment around Brisbane so thickly that you could hardly walk through it. One had to wait for rain to soften the ground so that it could be pulled up by hand. Then a fresh crop sprang up from the seed that had been dropped in the pulling, and so it went on.

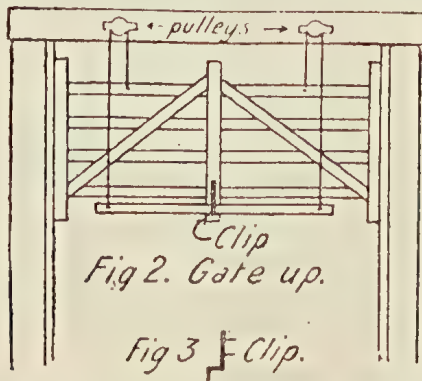
To-day the name that was then in everybody's mouth is practically unheard of. That pest has gone at any rate from around Brisbane, and in my opinion the sparrow is very largely responsible for its disappearance.

AN INGENUOUS LIFT GATE.

The lift-gate illustrated has the great advantage of dispensing with balancing weights. The gates are made of 3-inch by 1-inch pine throughout, 10 feet long, the battens being spaced 6 inches apart, the bottom batten 7 inches from the ground, and



the top bar 3 feet from the ground. The pulleys are ordinary cast pulleys, fastened with four screws. They are placed about 4 feet apart. The fillets between which the gates run are 2 inches by $1\frac{1}{2}$ inches. The iron clip (fig. 3) is made of $1\frac{1}{4}$ inches by $\frac{1}{4}$ inch flat iron of the shape shown (fig. 3), and is bolted on to middle stay of gate.



The crosspiece, which goes under the clip and holds the gate up, is 5 feet long by 2 inches by 2 inches pine. The clip has sufficient turn to take a crosspiece of this thickness.

Answers to Correspondents.

Molasses Grass (*Melinis minutiflora*).

J.H. (Henley Park, C.Q.)—

The pamphlet on Molasses Grass is much appreciated. The grass is well known here and has already been the subject of experiment in Queensland and New South Wales. Some years ago the Director of Agriculture (Mr. H. C. Quodling) imported some seed and had it well tested on the Atherton Tableland, where the climatic conditions resemble those of its native habitat. A good germination was followed by extraordinary growth, but the grass proved somewhat unpalatable and was not relished by cattle. They preferred *Paspalum* and *Rhodes*, the two introduced grasses commonly grown in the locality. The following year it was considered advisable to eradicate the grass, for, under the forcing conditions existing in the locality, there was a danger of its getting out of hand and becoming a pest in the cultivation paddocks, and, perhaps, smothering the other introduced grasses, the value of which had been fully established.

“Brazilian Stink Grass” is another name for the Molasses Grass. The grass has a strong smell resembling the aroma of a pig-stye. This, of course, may not be strongly objected to by very hungry cattle.

The Agrostologist of the Department of Agriculture, New South Wales (Mr. J. N. Whittet), has courteously supplied us with the following note on Molasses Grass:—This grass has been referred to under a number of different names, such as Molasses, Stink, Brazilian Stink; its correct botanical name, however, being *Melinis minutiflora*.

In Western tropical Africa it is known as *Efwatakala*, and is supposed to be identical with the “*Godura*” of Brazil, and “*Yaragua*” of Colombia.

It was introduced into New South Wales many years ago, and has been grown at the various Experiment Farms here in order to test its value as a grazing proposition. Although in other parts of the world it has been reported as being of exceptional value in choking out scrub, &c., it has not proved its value with us in this respect, in fact, on the Northern Rivers *Paspalum* (*Paspalum dilatatum*) overruns *Melinis minutiflora*.

We have also found that stock are not partial to this plant, mainly because of the fact that it is extremely hairy; the hairs exude a sticky oil which has a strong musky odour. Stock as a general rule do not find strong smelling plants palatable, and invariably refuse to eat them.

The grass is a summer grower, and in districts where heavy frosts are experienced the plants are cut back. Being a tropical grass it requires a long summer season with heavy rainfall and good soil conditions to produce a large amount of growth.

Recently reports from tropical Africa and South America have come to hand which state that ticks and tsetse flies find the grass objectionable, probably owing to the oil exuded by the hairs of the plant. In a recent issue of “*Kew Bulletin*,” England, information to this effect is given; some collectors even going so far as to state that when the grass is growing in any quantity its odour is very offensive to human beings.

Cattle feeding on this grass are reported to be less subject to ticks, and in tropical Africa the tsetse fly is supposed to be ensnared by the sticky oil exuded by the plant. An old report from Brazil stated that both cattle and horses were fond of this grass, but although they soon fatten on it the latter get short-winded if feeding on it for any length of time.

The matter of planting this grass in tick-infested areas in New South Wales has received consideration, but as *Melinis minutiflora* requires very good soil conditions and will not withstand the crowding out effect of *Paspalum*, the test would prove ineffective; the fact that in New South Wales stock do not eat the grass readily should also be taken into consideration before extensive areas are planted.

The grass forms very small light seed, but the main methods of propagation are by planting rooted cuttings, runners, or divisions of the main root system.

To Destroy Weeds on Paths.

A.C.R. (Morningside)—

To destroy grass or weeds on gravel paths or on chip tennis courts an arsenic mixture (1 lb. of white arsenic with $\frac{1}{4}$ lb. of caustic soda dissolved in 4 gallons of water) is often used, being both cheap and effective. A fairly concentrated solution of common salt applied hot is also effective.

Beef Pickle.

F.G.P. (Allawah)—

- (1) *Beef Pickle*.—4 qts. cold water, 1 lb. common salt, 6 oz. brown sugar, $\frac{1}{4}$ oz. saltpetre.

Boil the above for ten minutes, skimming frequently. Strain, preferably into an earthenware vessel. When cold put in the meat, and let it remain in pickle for ten days. If not completely immersed, it must be turned every day.

- (2) *Dry Beef Pickle*.—1 lb. common salt, 2 oz. brown sugar, $\frac{1}{4}$ oz. saltpetre, $\frac{1}{4}$ teaspoonful of ground black pepper.

Mix together. Rub well into the meat, which must be turned and rubbed every day for seven or eight days, or until sufficiently salt.

Spiced Beef.—(A) For 10 to 12 lb. beef:— $\frac{1}{2}$ oz. saltpetre, $\frac{1}{2}$ oz. bay salt, $\frac{1}{4}$ oz. black pepper, $\frac{1}{4}$ oz. allspice, $\frac{1}{2}$ teaspoonful ground ginger, $\frac{1}{4}$ teaspoonful cloves, $\frac{1}{4}$ teaspoonful mace, 3 oz. common salt, 3 oz. brown sugar.

(A) For 10 or 12 lb. beef.—1 dessertspoonful black pepper, $\frac{1}{2}$ teaspoonful ginger, 1 saltspoonful powdered cloves, 1 saltspoonful grated nutmeg, $\frac{1}{2}$ saltspoonful mace.

(B) For 10 or 12 lb. beef:—1 dessertspoonful black pepper, $\frac{1}{2}$ teaspoonful ginger, 1 saltspoonful powdered cloves, 1 saltspoonful nutmeg, $\frac{1}{2}$ saltspoonful mace.

Drain the beef from the pickle, mix together the above, sprinkle over the entire surface, roll and skewer into good shape. Cook slowly for four hours, then press it between two boards or dishes until cold.

FORTHCOMING SHOWS.

Laidley: 9th and 10th July.
Bowen: 9th and 10th July.
Woodford: 10th and 11th July.
Gatton: 16th and 17th July.
Townsville: 16th and 17th July.
Caboolture: 17th and 18th July.

Sunnybank: 19th July.
Barealdine: 22nd and 23rd July.
Charters Towers: 23rd and 24th July.
Rosewood: 23rd and 24th July.
Ithaca: 25th and 26th July.
Nambour: 30th and 31st July.

Ayr: 1st and 2nd August.
Mount Gravatt: 2nd August.
Cairns: 6th and 7th August.
Royal National: 11th to 16th August.
Gympie: 20th and 21st August.

Ingham: 22nd and 23rd August.
Belmont: 23rd August.
Imbil: 27th and 28th August.
Coorparoo: 30th August.

Crow's Nest: 4th September.
Wynnum: 6th September.
Pomona: 10th and 11th September.
Esk Bushman's Carnival: 10th and 11th September.

Beenleigh: 11th and 12th September.
Zillmere: 13th September.
Nerang: 19th September.
Stephens: 20th September.
Rocklea: 27th September.

Kenilworth: 2nd October.
Toombul: 3rd and 4th October.
Southport: 10th October.

Enoggera: 11th October.
Ascot: 25th October.

Farm and Garden Notes for August.

Land which has been lying fallow in readiness for early spring sowing should now be receiving its final cultivation prior to seeding operations. Potato-planting will be in full swing this month, and in connection with this crop the prevention of fungoid diseases calls for special attention. Seed potatoes, if possible, should be selected from localities which are free from disease; they should be well sprouted, and, if possible, should not exceed 2 oz. in weight. Seed potatoes of this size are more economical to use than those large enough to necessitate cutting. If, however, none but large-sized seed are procurable, the tubers should be cut so that at least two well-developed eyes are left. The cut surfaces require to be well dusted with slacked lime, or wood ashes, as soon as possible after cutting. Where it is necessary to take action to prevent possible infection by fungoid disease, the dipping of potatoes in a solution of 1 pint of 40 per cent. formalin to 15 gallons of water, and immersing for one hour, will be found effective. Bags intended for the subsequent conveyance of tubers to the paddock should also be treated and thoroughly dried. After dipping, spread out the potatoes and thoroughly dry them before re-bagging. Where the tubers are cut, the dipping is, of course, carried out prior to cutting.

Arrowroot, yams, ginger, and sugar-cane may be planted this month in localities where all danger from frosts is over.

Maize may be sown as a catch crop, providing, of course, that sufficient soil moisture is available.

Sweet-potato cuttings may also be planted out towards the end of the month.

Weeds will now begin to assert themselves with the advent of warmer weather; consequently cultivators and harrows should be kept going to keep down weed growths in growing crops and on land lying fallow, as well as on that in course of preparation for such crops as sorghums, millets, or panicums, maize, and summer-growing crops generally.

Tobacco seed may be sown on previously burnt and well prepared seed-beds.

Kitchen Garden.—Nearly all spring and summer crops can now be planted. Here is a list of seeds and roots to be sown which will keep the market gardeners busy for some time: Carrots, parsnips, turnip, beet, lettuce, endive, salsify, radish, rhubarb, asparagus, Jerusalem artichoke, French beans, runner beans of all kinds, peas, parsley, tomato, egg-plant, sea-kale, cucumber, melon, pumpkin, globe artichokes. Set out any cabbage plants and kohlrabi that are ready. Towards the end of the month plant out tomatoes, melons, cucumbers, &c., which have been raised under cover. Support peas by sticks or wire-netting. Pinch off the tops of broad beans as they come into flower to make the beans set. Plough or dig up old cauliflower and cabbage beds, and let them lie in the rough for a month before replanting, so that the soil may get the benefit of the sun and air. Top dressing, where vegetables have been planted out, with fine stable manure has a most beneficial effect on their growth, as it furnishes a mulch as well as supplies of plant food.

Flower Garden.—All the roses should have been pruned some time ago, but do not forget to look over them occasionally, and encourage them in the way they should go by rubbing off any shoots which tend to grow towards the centre. Where there is a fine young shoot growing in the right direction, cut off the old parent branch which it will replace. If this work is done gradually it will save a great deal of hacking and sawing when next pruning season arrives. Trim and repair the lawns. Plant out antirrhinums (snapdragon), pansies, hollyhocks, verbenas, petunias, &c. Sow zinnias, amaranthus, balsam, chrysanthemum, marigolds, cosmos, coxcombs, phloxes, sweet peas, lupins; and plant gladiolus, tuberose, amaryllis, paneratum, ismene, crinums, belladonna, lily, and other bulbs. In the case of dahlias, however, it will be better to place them in some warm, moist spot, where they will start gently and be ready to plant out in a month or two. It must be remembered that this is the driest of our months. During thirty-eight years the average number of rainy days in August was seven, and the mean average rainfall 2.63 in., and for September 2.07 in., increasing gradually to a rainfall of 7.69 in., in February.

Orchard Notes for August.

THE COAST DISTRICTS.

The remarks that have appeared in these notes during the last few months respecting the handling and marketing of citrus fruits apply equally to the present month. The bulk of the fruit, with the exception of the latest ripening varieties in the latest districts, is now fully ripe, and should be marketed as soon as possible, so that the orchards can be got into thorough order for the Spring growth. All heavy pruning should be completed previous to the rise in the sap; and where Winter spraying is required, and has not yet been carried out, no time should be lost in giving the trunks, main branches, and inside of the trees generally a thorough dressing with lime and sulphur wash.

Where citrus trees are showing signs of failing, such as large quantities of dead or badly diseased wood in the head of the tree, they can (provided the root system is healthy) be renovated by cutting back the entire top of the tree till nothing but sound healthy wood is left. This should be thinned out, only sufficient main limbs being left from which to form a well-balanced tree, and the trunk and limbs so left should receive a dressing of lime sulphur, or Bordeaux paste.

Healthy trees that are only producing inferior fruit should be treated in a similar manner, and be either grafted with an approved variety direct or be allowed to throw out new growth, which can be budded in due course. The latter method is to be preferred, and an inferior and unprofitable tree can thus be converted in the course of a couple of years into a profitable tree, producing good fruit.

Where orchards have not already been so treated, they should now be ploughed so as to break up the crust that has been formed on the surface during the gathering of the crop, and to bury all weeds and trash. When ploughed, do not let the soil remain in a rough, lumpy condition, but get it into a fine tilth, so that it is in a good condition to retain moisture for the tree's use during Spring. This is a very important matter, as Spring is our most trying time, and the failure to conserve moisture then means a failure in the fruit crop, to a greater or lesser extent.

Do not be afraid if you cut a number of surface roots when ploughing the orchard, but see that you do cut them, not tear them. Use a disc plough and keep the discs sharp, and the root-pruning the trees will thus receive will do more good than harm, as it will tend to get rid of purely surface roots.

Planting of all kinds of fruit trees can be continued, though the earlier in the month it is completed the better, as it is somewhat late in the season for this work. The preparation of land intended to be planted with pineapples or bananas should be attended to, and I can only reiterate the advice given on many occasions—viz., to spare no expense in preparing the land properly for these crops—as the returns that will be obtained when they come into bearing will handsomely repay the extra initial expense. Growers of pineapples and bananas who send their fruit to the Southern markets should take more care in the grading and packing of such fruit, as their neglect to place it on the market properly means a big difference in price, and entails a loss that could be avoided had the necessary care and attention been given. The same remarks apply to the marketing of citrus fruits, papaws, custard apples, strawberries, cucumbers, and tomatoes, all of which are in season during the month.

The pruning of all grape vines should be completed, and new plantings can be made towards the end of the month. Obtain well-matured, healthy cuttings, and plant them in well and deeply worked land, leaving the top bud level with the surface of the ground, instead of leaving 6 or 7 in. of the cutting out of the ground to dry out, as is often done. You want only one strong shoot from your cutting, and from this one shoot you can make any shaped vine required. Just as the buds of the vine begin to swell, but before they burst, all varieties should be dressed with sulphuric acid solution, composed of three-quarters of a pint of commercial sulphuric acid to one gallon of water; or, if preferred, this mixture can be used instead—viz., dissolve 5 lb. of sulphate of iron (pure copperas) in one gallon of water, and when dissolved add to it half a pint of sulphuric acid. This is the winter treatment for the prevention of anthracnose or black spot, and for downy mildew, and should on no account be neglected.

Fruit-fly will make its appearance during the month, and citrus and other fruits are likely to be attacked. Every grower should, therefore, do his best to destroy as many flies as possible, both mature insects and larvæ, the former by trapping or otherwise, and the latter by gathering and destroying all infested fruit. If this work is carried out properly, a large number of flies that would otherwise breed out will be destroyed, and the rapid increase of the pest be materially lessened. The destruction of fruit-flies early in the season is the surest way of checking this serious pest.

Keep a careful lookout for orange-sucking bugs, and destroy every mature or immature insect or egg that is seen. If this work is done thoroughly by all citrus growers there will be far fewer bugs to deal with later on, and the damage caused by this pest will be materially reduced. Destroy all elephant beetles seen on young citrus trees, and see that the stems and main forks of the trees are painted with a strong solution of lime sulphur.

GRANITE BELT, SOUTHERN AND CENTRAL TABLELANDS.

The pruning of all deciduous trees should be finished during the month, and all such trees should be given their annual winter spraying with lime sulphur. The planting of new orchards should, if possible, be completed, as it is not advisable to delay. Later planting can be done in the Granite Belt, but even there earlier planting is to be preferred.

Peach trees, the tops of which have outlived their usefulness and of which the roots are still sound, should be cut hard back so as to produce a new top which will yield a good crop of good fruit the following season in from fifteen to eighteen months, according to the variety.

Apple, pear, or plum trees that it is desirable to work over with more suitable varieties should also be cut hard back and grafted. All almond, peach, nectarine, and Japanese plum trees should be carefully examined for black peach aphid, as, if the insects which have survived the Winter are systematically destroyed, the damage that usually takes place from the ravages of this pest later on will be materially lessened.

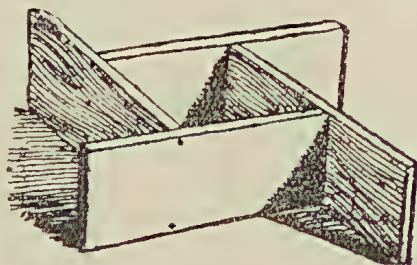
Woolly aphid should also be systematically fought wherever present. The best all-round remedy for these two pests is spraying with black leaf 40.

In the warmer parts of these districts the pruning of grape vines should be completed, and they should receive their Winter dressing for black spot and downy mildew, as recommended for the Coast. In the Granite Belt the pruning of vines should, however, be delayed to as late in the season as possible, so as to keep the growth back and thus endeavour to escape late Spring pests.

Where orchards and vineyards have been pruned and sprayed, the land should be ploughed and brought into a state of as nearly perfect tilth as possible, so as to retain the moisture necessary for the proper development of the trees or vines and the setting of their fruit.

HOLDER FOR SALT LICKS.

It is frequently desired to have a salt box in the paddocks where live stock are grazed. Some animals seem to delight in upsetting the usual type of box, but one made according to the drawing, with the sides extending beyond the



corners, will be proof against the mischievous antics of the stock. The pieces for the box are cut just twice the length required for the actual dimensions of the box. The same principle may be applied for feed boxes placed about the farmyard for cattle and horses.—“Popular Mechanics.”

ASTRONOMICAL DATA FOR QUEENSLAND.

TIMES COMPUTED BY D. EGLINTON, F.R.A.S.

TIMES OF SUNRISE AND SUNSET.

AT WARWICK.

1924.	JULY.		AUGUST.		SEPTEMBER.	
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.
1	6.46	5.6	6.35	5.21	6.8	5.36
2	6.46	5.6	6.34	5.22	6.7	5.37
3	6.46	5.6	6.33	5.23	6.6	5.37
4	6.46	5.6	6.32	5.24	6.4	5.38
5	6.46	5.7	6.31	5.24	6.3	5.38
6	6.46	5.7	6.31	5.24	6.2	5.39
7	6.46	5.7	6.31	5.24	6.0	5.39
8	6.46	5.8	6.30	5.24	5.59	5.40
9	6.45	5.8	6.29	5.25	5.58	5.40
10	6.45	5.9	6.29	5.25	5.57	5.41
11	6.45	5.10	6.28	5.26	5.56	5.42
12	6.44	5.11	6.27	5.27	5.54	5.43
13	6.44	5.12	6.26	5.28	5.53	5.44
14	6.43	5.12	6.25	5.29	5.52	5.44
15	6.43	5.12	6.25	5.29	5.51	5.44
16	6.43	5.12	6.24	5.29	5.50	5.44
17	6.43	5.13	6.23	5.30	5.49	5.45
18	6.43	5.13	6.22	5.30	5.48	5.45
19	6.43	5.13	6.21	5.30	5.47	5.45
20	6.42	5.14	6.20	5.31	5.46	5.45
21	6.42	5.14	6.19	5.31	5.45	5.46
22	6.42	5.14	6.18	5.31	5.44	5.46
23	6.42	5.15	6.17	5.32	5.43	5.46
24	6.41	5.15	6.16	5.32	5.42	5.46
25	6.41	5.16	6.15	5.33	5.41	5.47
26	6.40	5.17	6.14	5.33	5.39	5.47
27	6.40	5.17	6.13	5.34	5.38	5.48
28	6.39	5.18	6.12	5.35	5.36	5.48
29	6.38	5.18	6.11	5.35	5.35	5.49
30	6.37	5.19	6.10	5.36	5.34	5.50
31	6.36	5.20	6.9	5.36	...	...

Phases of the Moon, Occultations, &c.

The times stated are for Queensland, New South Wales, Victoria, and Tasmania, when "Summer" Time is not used.

2 July	☾ New Moon	3 35 p.m.
10 "	☾ First Quarter	7 46 a.m.
16 "	☾ Full Moon	9 49 p.m.
24 "	☾ Last Quarter	2 35 a.m.

Perigee 15th July, 8.6 a.m.

Apogee 27th July, 10.30 a.m.

Venus will be in inferior conjunction with the sun, that is between the earth and the sun, nearly in a straight line with the latter. On 1st July, 10 p.m., the moon being nearly new will be apparently in close proximity. On 3rd July, 11 p.m., the earth will be at its greatest distance from the sun. Mercury will be in superior conjunction with the sun, that is on the far side of its orbit at 4 a.m. on the 6th. Saturn will be in conjunction with the moon on the 10th, at 10.54 p.m., Saturn being about four times the diameter of the moon above it. Jupiter will be in conjunction with the moon, or about nine times the diameter above it near midnight on the 13th. On the 19th, 10.34 p.m., Mars will be in conjunction with the moon or about nine times its diameter above it.

1 Aug.	☾ New Moon	5 41 a.m.
8 "	☾ First Quarter	1 41 p.m.
15 "	☾ Full Moon	6 19 a.m.
22 "	☾ Last Quarter	7 10 p.m.
30 "	☾ New Moon	6 36 p.m.

Perigee 12th August, 5.54 a.m.

Apogee 24th August, 3.42 a.m.

There will be three eclipses this month. (1) A partial eclipse of the sun will not be observable in Queensland. It rises on the 1st and will be over at 7.4 a.m.; (2) a total eclipse of the moon between the hours of 5.31 and 7.9 a.m. on the 15th, visible in Queensland; (3) a partial eclipse of the sun on the 30th, commencing at 4.50 p.m., and continuing for more than two hours after sunset, but not visible in Australia.

Venus will be at its greatest brilliancy on the 7th; it will then become a morning star. The moon will pass below Jupiter on the 10th at 6 a.m. Mercury will be at its greatest elongation east of the sun on the 15th and will have become observable after sunset. The moon will pass Mars on the 16th, at 4.20 a.m. Mercury will be about 18 degrees (three times the length of the Southern Cross) to the south-east of Regulus on the 15th. On the 23rd, Mars will be in its best position for observation, being near its least distance from the earth and almost at its greatest brilliancy.

5 Sept.	☾ First Quarter	6 45 p.m.
13 "	☾ Full Moon	5 0 p.m.
21 "	☾ Last Quarter	1 35 p.m.
29 "	☾ New Moon	6 15 a.m.

Perigee 7th September, 5 p.m.

Apogee 20th September, 10.54 p.m.

On the 23rd, at 6 a.m., the sun will be crossing the celestial equator on its way southwards, and the equinox will occur, the sun setting due west on the 23rd and rising due east on the 24th. Between 1 and 2 o'clock on the afternoon of 25th September the apparent proximity, to the naked eye, of the moon and Venus should form an interesting spectacle about half-way between the sun and the western horizon. Mercury will be at its greatest elongation W (nearly 18 degrees, or three times the length of the Southern Cross) on the 27th, at 7 p.m. The planets Venus and Neptune will be apparently very close to one another (about twice the diameter of the moon) on the 30th.

For places west of Warwick and nearly in the same latitude, 28 degrees 12 minutes S., add 4 minutes for each degree of longitude. For example, at Inglewood, add 4 minutes to the times given above for Warwick; at Goondiwindi, add 8 minutes; at St. George, 14 minutes; at Cunnamulla, 25 minutes; at Thargomindah, 33 minutes; and at Oontoo, 43 minutes.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night; when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

[All the particulars on this page were computed for this Journal, and should not be reproduced without acknowledgment.]

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF MAY, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING MAY 1924 AND 1923, FOR COMPARISON.

Divisions and Stations.	AVERAGE RAINFALL		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	May.	No. of Years' Records.	May, 1924.	May, 1923.		May.	No. of Years' Records.	May, 1924.	May, 1923.
<i>North Coast.</i>					<i>South Coast—continued:</i>				
Atherton ...	2.10	23	2.63	0.10	Nambour ...	5.00	28	3.47	2.02
Cairns ...	4.64	42	5.22	1.14	Nanango ...	1.60	42	0.41	0.10
Cardwell ...	3.74	52	1.52	1.15	Rockhampton ...	1.54	37	0.48	0.01
Cooktown ...	3.09	48	2.79	0.30	Woodford ...	2.99	37	1.82	2.45
Herberton ...	1.74	37	0.90	0.49					
Ingham ...	3.70	32	0.79	3.72					
Innisfail ...	12.78	43	14.20	3.71					
Mossman ...	3.54	15	2.10	0.42					
Townsville ...	1.40	53	0.15	0.69					
<i>Central Coast.</i>					<i>Darling Downs.</i>				
Ayr ...	1.22	37	0.07	...	Dalby ...	1.34	54	0.03	0.31
Bowen ...	1.36	53	0.54	0.77	Emu Vale ...	1.18	28	0.26	0.18
Charters Towers ...	0.83	42	0.34	0.07	Jimbour ...	1.23	36	...	1.03
Mackay ...	3.89	53	6.06	...	Miles ...	1.53	39	...	0.03
Proserpine ...	5.02	21	3.65	...	Stanthorpe ...	1.94	51	0.44	0.25
St. Lawrence ...	1.87	53	0.38	...	Toowoomba ...	2.27	52	0.40	0.42
					Warwick ...	1.60	59	0.14	0.08
<i>South Coast.</i>					<i>Maranoa.</i>				
Biggenden ...	1.81	25	0.45	0.06	Roma ...	1.44	50	0.37	0.02
Bundaberg ...	2.69	41	0.22	...					
Brisbane ...	2.83	73	1.31	0.39					
Childers ...	2.27	29	0.65	...					
Crohamhurst ...	5.14	30	4.29	0.89					
Esk ...	2.07	37	0.61	0.44					
Gayndah ...	1.57	53	0.08	...					
Gympie ...	3.00	54	1.01	0.67					
Glasshouse Mts. ...	3.62	16	...	1.24					
Kilkivan ...	1.92	45	0.05	0.25					
Maryborough ...	3.09	53	1.65	0.75					
					<i>State Farms, &c.</i>				
					Bungewongorai ...	0.61	10	...	0.05
					Gatton College ...	1.76	25	0.30	0.12
					Gindie ...	1.05	25	0.10	...
					Hermitage ...	1.27	18	0.11	0.12
					Kairi ...	2.13	10	2.65	0.24
					Sugar Experiment Station, Mackay	3.50	27	4.40	...
					Warren ...	1.11	10	...	...

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for May, 1924, and for the same period of 1923, having been compiled from telegraphic reports, are subject to revision.

GEORGE E. BOND,
Meteorologist.

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QUEENSLAND AGRICULTURAL JOURNAL

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AUGUST, 1924.

PART 2.

Event and Comment.

The Current Issue.

Observations on the State's agricultural progress and problems, which were embodied in the Speech of His Excellency the Governor at the opening of Parliament, will be read with interest. The stud pigs purchased by the Government in the South recently are well described and illustrated. An article on the dentition of the pig contains some very useful information. The activities of the Bureau of Sugar Experiment Stations are also featured strongly. There are some very useful notes on the economic value of certain Queensland parasitic insects. There is also an interesting account of some of the means adopted by the Prickly-pear Commission in combating the pear pest. Maize growers will be interested keenly in a reprinted article on the feeding value of maize grain.

Ratoon Cotton.

The Government has decided, pending the passing of amending legislation, not to enforce the provisions of the Cotton Industry Act prohibiting cotton ratooning. In making this announcement the Minister for Agriculture (Hon. W. N. Gillies) made it clear that growers will be allowed to ratoon this year's annual cotton, provided the shrubs are cut back to 6 in. above the ground before 15th September. Permission to ratoon applies only to annual plants, that is to say that all ratoon plants now in existence must be totally destroyed. The cultivation of second ratoons is absolutely prohibited. Pruning must be completed by 15th September, and growers intending to ratoon this season's plants must notify the Department immediately. Cuttings accumulated in the process of ratooning must, together with all other cotton-field debris, be destroyed totally by fire by the same date. This also applies to cotton plants which growers do not intend to ratoon. It is not proposed that the relaxation of the ratooning restrictions shall mean that cotton shall not continue to be subject to a "close season." The necessity of keeping cotton fields thoroughly clean as a precaution against pests cannot be ignored. The Government guarantee will not apply to ratoon cotton next year, but it may be ginned at authorised ginneries. It has been decided to gin and market ratoon cotton separately, and if, after meeting all charges, there is any surplus above the amount advanced against the consignment on its receipt at the gin, as with annual cotton, it will be returned *pro rata* to the ratoon suppliers. Ratoon cotton must be harvested and bagged separately. The

bags must be labelled "Ratoon." The mixing of annual and ratoon cotton in the one container is absolutely forbidden, and heavy penalties are provided for anyone found guilty of so doing. Insistence will be made on the observance of the existing stipulation that all seed for cotton-growing must be obtained through the Department of Agriculture. Legislative provision for the registration of cotton growers already exists, and this provision will be strengthened in the amending Bill to be introduced this session by making the possession of a license by the grower essential.

Turning a New Furrow.

The Education Department is turning a new furrow in the field of rural instruction. At the Nambour Rural School a course of instruction in the care, repair, and use of farm implements and machinery, including motor vehicles, is about to be instituted. Milking machines, power plants, and motors are coming into such general use that a knowledge of mechanics is becoming a necessity to the farmer. The principle behind the Rural School classes is to enable the sons of farmers to be self-reliant when they undertake the duties of life. The maintenance of machinery in a proper manner at a minimum of expense is the aim of the new classes. For the present, students in the new course will be limited to those attending the Rural School who have passed through or are attending courses in blacksmithing, plumbing, or woodwork. Consideration will be given later to arranging evening classes in motor mechanics for past students of the school.

The Country Women's Association.

The aims of the Country Women's Association—the making of life more pleasant for country women, and the extension of bush nursing homes and book clubs—are such as to heartily commend themselves to all interested in the lives of inland dwellers. Included in the activities of the Association is the establishment of seaside bungalows in which country women may secure all the comforts of a pleasant holiday at the minimum of expense. The first of these coastal social centres was opened recently at Lota, near Manly, overlooking beautiful Moreton Bay. Speaking at the opening ceremony, His Excellency the Governor, Sir Matthew Nathan, remarked that the Country Women's Association had set high aims and ideals before the community. The Lota Home represented one of the first concrete results of the country women's efforts. With the wish that in the home many Western wives would find health and rest, and happiness in all its childish forms to scores of their little ones, he declared the home opened. In the course of further remarks Sir Matthew Nathan said that an enormous area of Western and Downs country and a large proportion of the rural population of Queensland would have to be served by seaside homes on the coast to the north and south of Brisbane if the purpose to make possible a seaside holiday to the people in the interior, who could not otherwise manage to get it, was to attain complete fruition. The general purpose would be helped on by the Country Women's Association's appeal now being made. A first response to the appeal had been the presentation by a generous family, in affectionate memory of a lost member, of the convenient and pleasantly situated property which was being dedicated that day. Very wisely those who had in hand the arrangements for its occupation had decided to proceed with these without awaiting the considerable enlargement and additional equipment necessary to make it fully adequate to the requirements of the first seaside home under the scheme. It was their hope that the home would be soon available for the families of the workers in the back country, without whom the city would be a small thing and the State have no prospect of advancement.

Young Judges at the Brisbane Show.

The six classes in the young judges' competitions at the Brisbane Show have attracted sixty-seven young men, who hail from all parts of Southern Queensland and the Northern Rivers district of New South Wales. The interest evinced in this commendable section of the show demonstrates clearly the good work the National Association is doing in encouraging young men to study the art of judging. Beneficial results undoubtedly will accrue from these competitions, as in the course of years competent judges will be provided within Queensland to determine the prize winners in the various shows held throughout the State. From the Queensland Agricultural High School and College, Gatton, twelve competitors have come, and the balance is drawn from the well-known dairying centres of Toogoolawah, Gatton, North Coast centres, parts of the Upper Burnett, Tweed Heads, and students from the Central Technical College. Most of them are sons of successful herd book dairy breeders, and for this reason should be well schooled in the tests required.

QUEENSLAND AGRICULTURE.

ITS PROGRESS AND PROBLEMS.

The Speech of His Excellency the Governor (Right Hon. Sir Matthew Nathan, P.C. (Ire.), G.C.M.G.) at the opening of the Second Session of the Twenty-third Queensland Parliament on 29th July contained the following references to the State's agricultural progress and problems:—

The Sugar Industry.

During the year, production in the sugar industry was greater in the northern area than ever previously recorded, though south of Townsville the crushing was below the estimate. The tribunal appointed under the arrangement with the Commonwealth Government has fixed the price of raw sugar for the current season at £27 per ton, but the Sugar Pool Board will not be able to pay the full price of £27 per ton to the millers, owing to the loss which is anticipated in finding an export market for the surplus production. As the present arrangement between the Federal and State Governments in respect of the marketing of the sugar crop will expire in 1925, some anxiety exists as to the policy of the Commonwealth Government for the future.

My advisers believe the present arrangements for the protection of the sugar industry is the best that could be devised. The embargo against the importation of sugar, except in the case of a shortage in the Australian production, and the regulation of the prices of cane, raw sugar, and refined sugar, ensure equitable treatment for all concerned, and are a much more satisfactory form of protection than any that could be afforded by the enactment of a fixed tariff.

If the Commonwealth Government consent to a continuation of the existing arrangement, legislation will be introduced in the Queensland Parliament for the purpose of defining more clearly the authority and obligations of the Sugar Pool Board.

The Dairying Industry.

The dairying industry, despite adverse seasons, is making steady progress in this State, which bids fair to become the premier dairying State of the Commonwealth. The area under artificial grasses has increased from 205,000 acres to 475,000 acres during the last ten years, an increase of 130 per cent.

Co-operative control by the farmers of manufacture in the dairying industry has made more rapid strides in Queensland than in any other State. Although co-operative control of marketing has been discussed for many years, it is only now that the matter is being taken up seriously and earnestly by those concerned.

Council of Agriculture.

The Council of Agriculture, after having been equipped with all the legislative powers the State can provide, have recognised that the problem cannot be solved without the co-operation of the Commonwealth and the other butter-producing States. The council, after making a comprehensive investigation into the question of production and marketing, convened an interstate dairying conference, and placed before that conference a scheme for interstate and oversea marketing, which was endorsed by the interstate delegates. This scheme is now the subject of negotiations with the Federal Government.

Fruit Marketing.

The year has seen a marked advance in the organisation of the fruitgrowers towards mutual help and protection. A large proportion of the fruitgrowers accepted the scheme put forward by the Council of Agriculture for the compulsory co-operative marketing of fruit. A special Act of control was passed last session to give effect to this policy, and although, like all rapid changes, the scheme was criticised for a time through the Press, the Fruit Marketing Committee, elected by the growers themselves, are succeeding in the work they were intended to do under the Act, and the more regulated marketing of fruit and the bringing of the producer and the consumer more closely together will result in a benefit to the community as a whole.

The Cotton Industry.

The cotton industry continues to advance despite the dry weather and numerous insect pests, although, owing to these causes, the yield per acre in many districts was not as good as might be wished. The harvesting season for seed cotton has been extended to meet the conditions of the season. The total yield is expected to reach 15,000,000 lb. of seed cotton. The outbreak of the pink boll-worm, which has been so destructive to cotton crops in other parts of the world, emphasises the wisdom of passing special legislation to insure the whole of the cotton stalks and debris being destroyed every year, and to provide a close season. Special precautions have been taken in the field and also to insure the effective treatment of seed prior to its being planted. The necessary apparatus has been installed for this purpose. The Commonwealth Government have imposed most rigid conditions regarding the importation of cotton seed.

The Durango variety of cotton, which produces a good crop and has proved to be of high value for spinning purposes, has been planted wherever possible, and for the 1924 planting it is estimated that sufficient seed will be available to plant 10,000 acres, and the following year there will be sufficient seed to meet all demands.

The conditions under which the Government are prepared to relax the embargo on the growing of ratoon cotton having been agreed to by the growers, through their delegates at a conference under the auspices of the Council of Agriculture, a Bill will be introduced to amend the Cotton Industry Act in the direction indicated.

The Queensland Producers' Association.

The several units in the scheme of agricultural organisation—namely, local producers' associations, district councils, and the Council of Agriculture—have settled down to their respective functions under the Act and are doing good work. There are 756 local producers' associations, with a membership of 23,000.

North Queensland Maize Pool.

In the Atherton district, granaries are being erected at a cost of approximately £70,000, the money being advanced by the Government to the Northern Queensland Maize Pool Board. These granaries are capable of holding about 400,000 bushels of maize, and the scheme provides for the latest drying and cleaning equipment. The completion of these granaries, which is expected in a few weeks' time, will enable the farmers to clean, dry, and store their crop, and thus regulate the supply and stabilise the price. It is believed, as a result of this scheme, that the area under maize will be considerably increased.

New Settlement.

The first section of 1,400 portions in the Upper Burnett and Callide Valley areas was made available for selection at the end of November last year. Already 650 portions have been allotted to new settlers, and a good proportion of these are now in occupation and are making improvements and preparing the land for cotton-growing, dairying, and general farming. The second section of the scheme, comprising about 1,400 portions, has been designed for selection and will probably be made available at the end of the year.

In the Clermont and Capella districts, sixty-one portions, ranging in area from 1,000 to 2,560 acres each, will be opened for perpetual lease selection towards the end of the year. The country is suitable for cotton-growing combined with dairying and sheep-raising. During the year an area of about 1,000,000 acres from pastoral holdings has been resumed for closer settlement.

The demand for rabbit and dog netting continues to increase, and my advisers are encouraging the enclosure of holdings in groups wherever possible.

Main Roads.

The operation of the Main Roads Board were continued during the year, and approximately 110 miles of road, including bridges, have been completed and thrown open, and about 150 miles are now under construction.

The Prickly-pear Problem.

My advisers have taken definite action to cope with the prickly-pear problem. A commission of three members has been appointed, which will exercise all the functions of the Land Court throughout the areas infested with prickly-pear, and also all administrative functions in respect of such lands. Poisons for the eradication of pear are being supplied to settlers at cheap rates, while the State Government is co-operating with the Commonwealth Government in carrying out biological experiments and research. It is anticipated that shortly a system of "buffer areas" will be proclaimed, and that by the activities of the commission the devastating spread of pear in this State will be stopped.

Forestry.

The classification, valuation, and survey of the Crown timber lands have been pushed on during the year. By the addition of 76,000 acres, the Crown forest area was increased to 4,800,000 acres. The past alienations of the forest resources are having a bad cumulative effect upon the life of the important timber industry of the State. It has been necessary to adopt careful measures in order to assure to the sawmills a sufficient supply of pine logs. The Forest Service has increased its pine-log output from 35,000,000 super. feet in 1918 to 44,000,000 super. feet in 1923 in its endeavour to cope with the situation. Careful technological researches have been made into the economic value of the 400 or 500 distinct tree species which are found in the forests of the State.

The Dawson Irrigation Project.

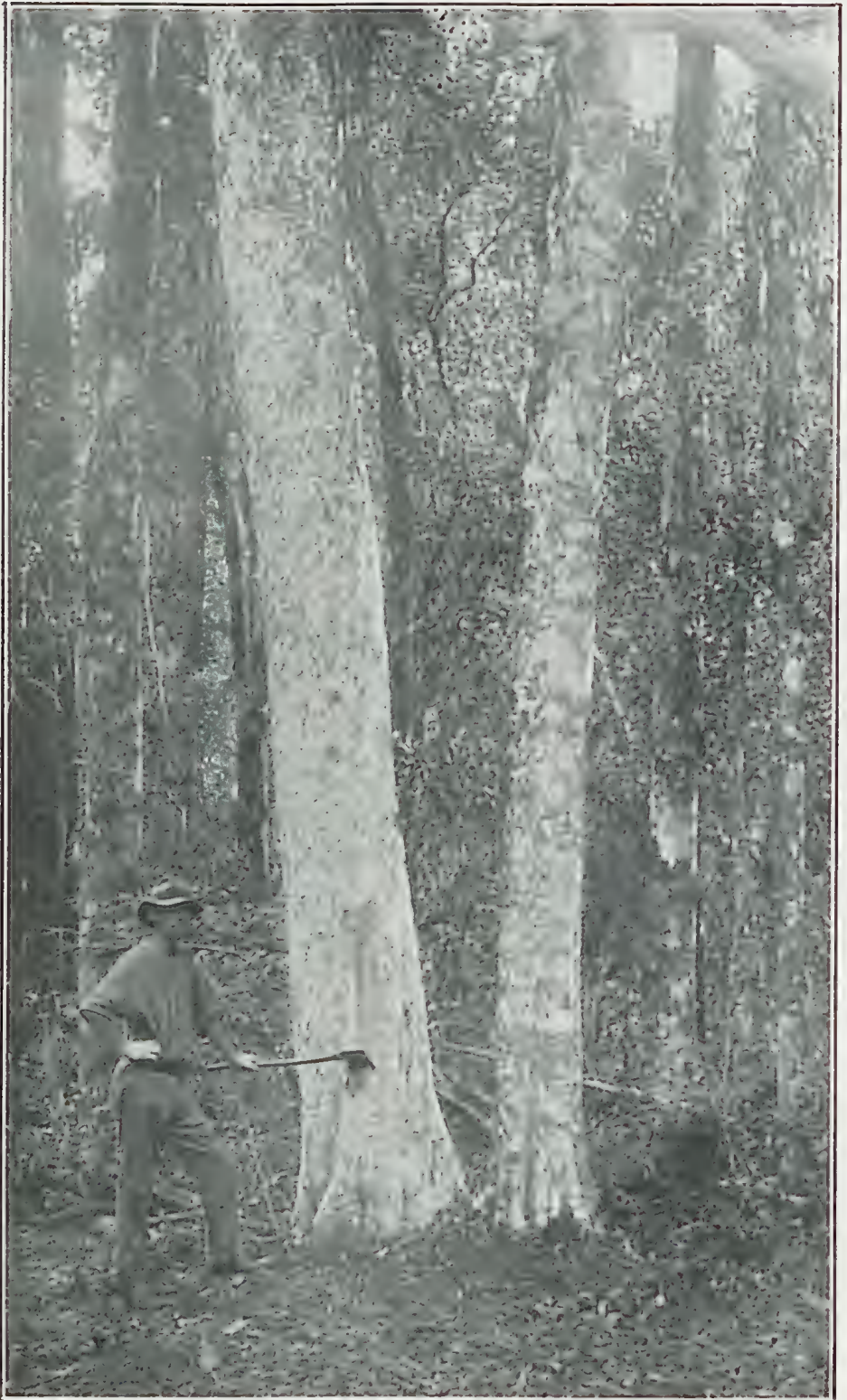
Satisfactory progress has been made on the Dawson Valley irrigation scheme, where the work is proceeding according to schedule. During my recent visit of inspection to the area, the pumping plant and electric power-house were opened by me, and the first water sent through the distributary channels on part of the preliminary 5,000 acres of irrigated lands. It is confidently anticipated by the Commissioner of Irrigation that the 5,000 acres will all be thrown open for occupation by December next.

The great work of damming the Dawson River, which is to follow on this preliminary irrigation project, is destined to play a prominent part in the future land settlement of the State, and is in every sense a truly national undertaking. Fodder grown on the irrigation area could be transported throughout the State in periods of drought, avoiding stock losses and stabilising rural industries. Thus the scheme, apart from settling thousands of families on farms, provides an insurance against losses during the droughts of the future.

QUEENSLAND TREES.

By C. T. WHITE, F.L.S., Government Botanist, and W. D. FRANCIS,
Assistant Botanist.

Sideroxylon Pohlmanianum does not appear to have a common popular name. The species is found on the Tweed River, in New South Wales, and is fairly common in many of the "scrubs" or rain forests of Queensland from the Southern border to Cairns in the North. The bark when cut exudes a milk-like sap. The fruit is black and somewhat plum-like, about 1 inch in diameter, and contains from two to five very hard, smooth seeds. The timber is pale in colour and has the appearance of pine, but is heavier. It should be useful for cabinet-making and general indoor work. The writers have noticed that the trees are common in some of the drier scrubs, such as those in the Nanango district, although it is also found in the more luxuriant rain forests of the North Coast line.



Photo, by Authors.]

PLATE 23.—SIDEROXYLON POHLMANIANUM, A TREE IN THE SCRUB NEAR NANÁNGO.
The tree on the right hand side of the picture is *Cupania anacardioides* var. *parrifolia*.



PLATE 24.—SIDEROXYLON POHLMANIANUM.

STUD PIGS FOR QUEENSLAND.

NEW BLOOD INTRODUCED.

Acting under instructions from the Minister for Agriculture (Hon. W. N. Gillies), the Instructor in Pig Raising (Mr. E. J. Shelton, H.D.A.) attended the Royal Agricultural Show at Sydney for the purpose of making extensive purchases of stud pigs for the several Government Institutions in this State.

A very careful selection has been made, and some really choice breeding stock introduced as a result of this visit, and it is hoped later to have available for sale the progeny of these selected animals at reasonable prices, so that farmers throughout the State may have an opportunity of securing fresh blood for their piggeries.

Inquiries as to the stock available, or for information regarding the purchases, should be addressed to the Managers of the State Farms at Kairi, N.Q., and Warren; to the Principal of Gatton College, T.P.O. South, and to the Medical Superintendent at Dunwich.

Detailed particulars of the pigs purchased are as follow:—

Berkshires.

Account Manager, State Farm, Kairi, via Cairns, North Queensland.

Berkshire Boars: "Bylands Tarboy" and "Brentwood Bylands."

Berkshire Sows: "Hazelbrook Lady" 5744, "Wilcannia Lilian," "Bylands Lassie," and "Parramatta Peg."

Of these, the boar, "Bylands Tarboy," was from a prominent prize-winning family in one of the largest classes in the show. His sire won second prize in Aged Berkshire Boar class, same show; his dam winning second prize in Aged Berkshire Sows—also a heavily contested class. The stud from which this boar comes is a noted one—viz., John Crane, of Nathalia, Victoria. He had a reserve of 75 guineas on the dam of "Bylands Tarboy," and considered her one of the best breeding sows in Australia.

The boar, "Brentwood Bylands," was selected from the first prize pen of boars under four months. His parents are well known prize winners at Southern Shows.

The sow, "Hazelbrook Lady" 5744, is sired by that old champion, "Bylands Pat" 1955; the dam's breeding traces back to "Empire Day," an unbeaten champion at Sydney and Melbourne Shows, a boar for which an offer of 100 guineas was refused.

The dam of the sow, "Wilcannia Lilian," took second prize, with litter, Sydney, 1923; first, with litter, Tongala, Victoria, 1921; first and champion, same show, 1922. She is the dam of "Wilcannia Agnes," second prize sow under nine months, Sydney, 1923, and first prize under fifteen months, Melbourne; also first and champion, Grand National Show, Victoria, 1923. Her granddam, "Renrow Lily," won first prize, Melbourne, 1918; also first, Tatura, Victoria. The sire of "Wilcannia Lilian's" dam, "Pendennis Bill" 2554, won first and champion, Tongala, Victoria, 1921. He was by "Brigadier" 1107, champion, Melbourne, 1916 and 1917. "Wilcannia Lilian's" sire, "Fashion Plate" 3916, won second, Ballarat; first and champion, Tongala, 1922. He was the sire of the winning boar, "Melbourne Royal" 1922, a boar which at under four months old sold for 35 guineas. He was sired by "Lord Wallace" 3915, by "Stephenhurst Mac" 2309, dam "Gippsland Poppy 2241, by "Empire Day" 741, reserved champion, Melbourne, 1914; champion, Sydney, 1914; champion, Korumburra, 1915; champion and herd-book ribbon; also first prize for best boar for producing bacon pigs, Sydney, 1915.

The sow, "Bylands Lassie," is a full sister to the boar, "Bylands Tarboy." The sow, "Parramatta Peg," has for her sire the first-prize boar, Sydney, 1923, "Conargo Major," 4221, who sold for 40 guineas at public auction.

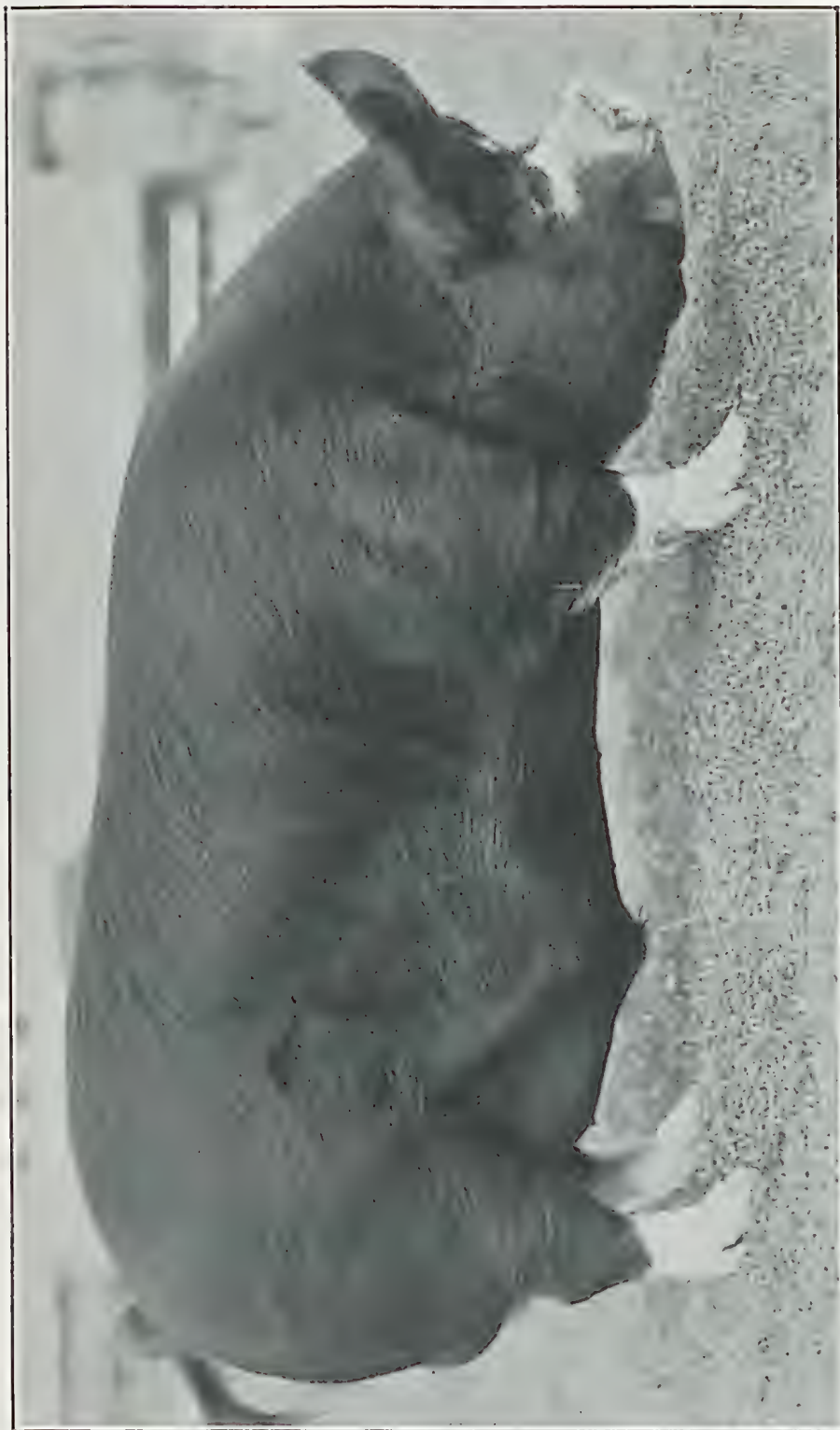


PLATE 25.—CHAMPION BERKSHIRE BOAR, "MURRAY GLEN STAR" 4969.

Purchased for the Queensland Agricultural High School and College, Gatton, at 50 guineas. This Boar has been a consistent prize-winner, and comes from a long line of prize-winning Berkshires. His sire, "Murray Glen Longfellow" 3681, has sired many champions. The strain is a well-known Victorian line of blood.

Berkshires.

Account Manager, State Farm, Warren, viâ Rockhampton.

Berkshire Boars: "Brentwood Beau" and "Wilmot Ron."

Berkshire Sows: "Danesboro Model," "Pigeon Grove Stella," "Bylands Bessie," and "Dundas Rosaleen."

Of these, the boar, "Brentwood Beau" 5559, was also a prize winner. His sire, "Bylands Boomer," is well known. He secured second prize in the Aged Berkshire class, beating last year's Melbourne champion. His strain have been much sought after in recent years. The boar, "Wilmot Ron," was bred in Tasmania by Norman Williams, Esq., of Wilmot. Mr. Williams has been very successful with his stud—a full brother to "Wilmot Ron" having realised 67 guineas at Sydney Show three years ago, after having won the Blue Ribbon there.

Of the sows, "Danesboro Model," represents the same class of blood. She won first and champion prizes both at Penrith and Blacktown Shows, 1924. She should develop into a prominent prize winner here. The sow, "Pigeon Grove Stella," won first prize in a very heavily contested class at Sydney Show this year. She had also won prizes at previous shows in New South Wales, and had been secured specially for exhibition at Sydney. She has since been mated to the champion boar, "Murray Glen Star," at Gatton. The sow, "Bylands Bessie," is a full sister to the boar, "Bylands Tarboy," sent to Kairi. The sow "Dundas Rosaleen" also comes from a very prolific and profitable line of blood, noted for early maturity. Her dam won third prize at Sydney Show, 1923, whilst full sisters and brothers were prominent prize winners. "Rosaleen" was one of the third prize pen of sows under four months, Sydney, this year. The Warren consignment should do much to popularise the Berkshire in Central Queensland, where pig-breeding is now recognised as a payable industry.

Berkshire, Tamworth, and Poland-China Boars and Sows.

Account Queensland Agricultural High School and College, Gatton.

Berkshire Boar: "Murray Glen Star" 4969.

Berkshire Sows: "Bylands Laney" 5238 and "Killarney Stella" 4249.

Tamworth Boars: "Danesboro Fred" 407 and "Blakeney Rex" 332.

Tamworth Sows: "Hawkesbury" sow (2092 H.A.C.), "Manning Juliet" 306, "Rosebank Rosy Queen" 113, "Blakeney Rose," "Orara Lass," "Oban Miss" 324.

Poland-China Boar: "Homeville Duke" 124.

Poland-China Sow: "Danesboro Winnie" 130.

Of this consignment, the Berkshire boar, "Murray Glen Star" 4969, was the champion Berkshire boar of the Show, and was purchased at 50 guineas to head the Gatton stud of Berkshires. He comes from a line of blood well known throughout Victoria and New South Wales as consistent prize-winning stock. He also won first and champion at Penrith and Blacktown Shows, New South Wales, 1923. He had to compete against several ex-champions at Sydney this year, including Mr. E. M. Lennie's "Wilcannia Special," a remarkably good boar, for which 60 guineas was refused at the show.

The sow, "Bylands Laney," was forward in pigs to Berk. boar "Bylands Senator" 5233, a well-known prize winner. Her sire, "Bylands Boomer" 4509, won second prize in aged Berkshire class, Sydney, 1924, whilst her dam, "Bylands Tassy" 4508, won third prize in the aged Berkshire sow class, same show. She should prove a valuable addition to the stud, and, as she has farrowed since arrival at Gatton, her litter should go a long way towards paying for her. The sow, "Killarney Stella" 4249, won first prize, Sydney, 1924, in class Berkshire sow with litter at foot. She was rearing eleven fine pigs at time of show. These were selling freely at up to 10 guineas each. Her sire is a son of the imported Berkshire boar, "Sutton's Improver" 1437, a boar which cost over 200 guineas, landed in Sydney, and coming from one of the most successful studs in America.

The Tamworth boar, "Danesboro Fred" 407, was one of the first prize pen of three Tamworth boars under four months at Sydney Show, 1923. He subsequently won first and champion prize at Penrith Show, and first prize at Blacktown Show, New South Wales, 1923, and second in Tamworth boar over fifteen months, Sydney Show, 1924. His parents have won numerous prizes at Manning River shows, New South Wales, including first prize Wingham Show, New South Wales, 1924, awarded to his dam, second prize same show to his sire, one of whose sons also won first prize, same show. The boar, "Blakeney Rex" 332, won first prize Sydney, 1924, in class for Tamworth boar under nine months. His parents also are prominent Manning River prize winners.

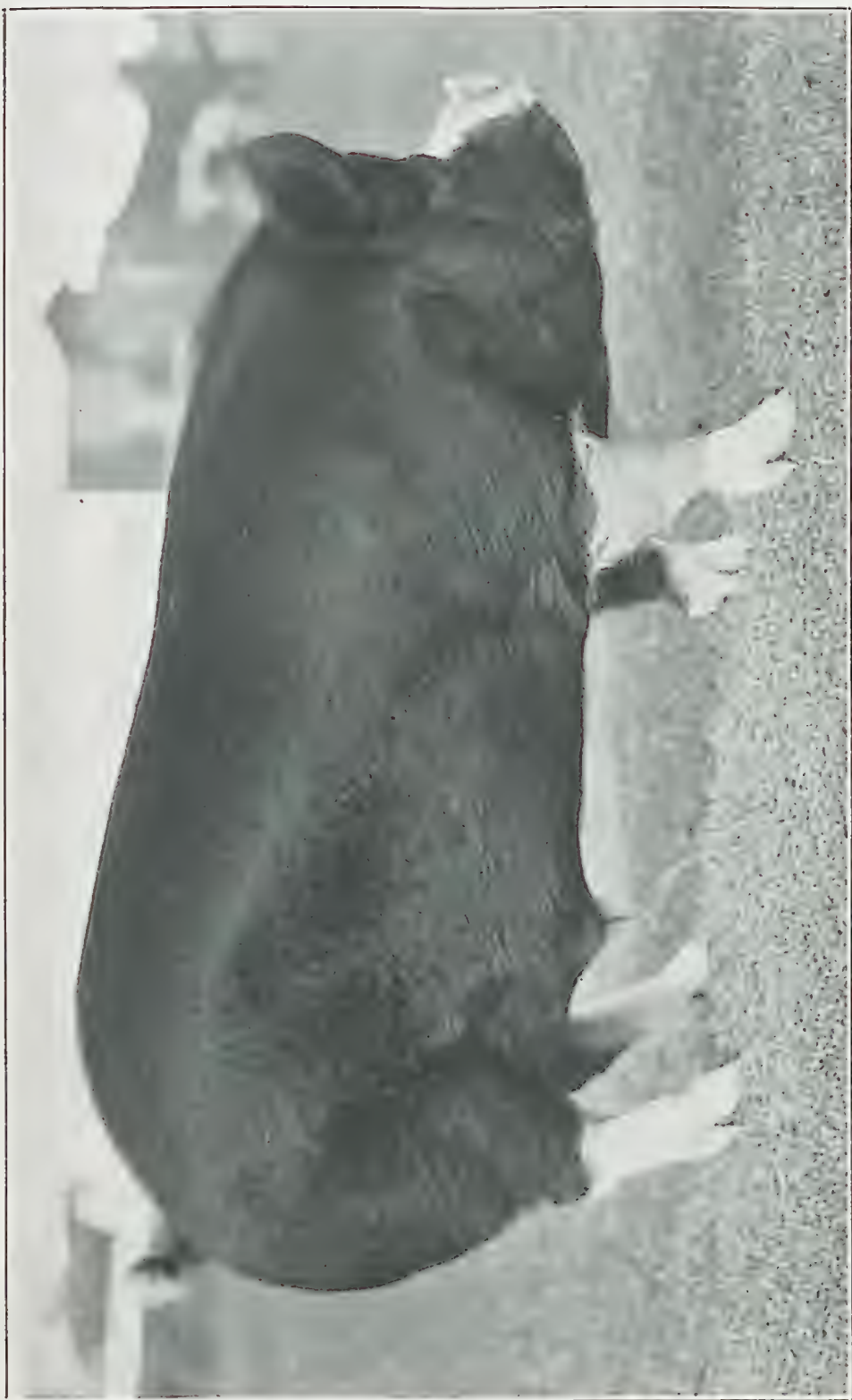


PLATE 26.—BERKSHIRE BOAR, "CARAVALE MAJOR," 5580, FIRST PRIZE BOAR, UNDER 15 MONTHS, SYDNEY SHOW, 1924.

This boar won in the best of company and at the stud sales realised 42 guineas. He also gained Second Prize, Melbourne Royal Show, 1923, in the four months' old class, which was heavily contested. He also secured First Prize, Nunurkah Show, Victoria. His full sister gained First Prize, Melbourne Show, 1922. His sire, "Goomallbee Nugget," 2176, was Champion at the Brisbane Show, 1923.



PLATE 27.—CHAMPION BERKSHIRE SOW, SYDNEY SHOW, 1924. G. R. LINBRICK'S "CONARGO TOPSY" 4228.

This sow was submitted to public auction, but finally the owner withdrew her from sale. Her reserve price was in the vicinity of 175 guineas. She represents a very prepotent up-to-date type of Berkshire, much sought after at Southern Shows. One of her sons, "Conargo Skipper" 5737, was purchased for the Dunwich Hospital, Queensland.



PLATE 28.—CHAMPION TAMWORTH SOW, SYDNEY SHOW, 1924. MRS. TINDALE'S "ROSEBANK ROSY QUEEN" 113.
This sow was purchased for the Gatton College stud. She was bred at the Hawkesbury Agricultural College, New South Wales, and is a direct representative of their imported strains.

Of the sows, the sow "Hawkesbury" 2092 was selected from the Hawkesbury College stud. She comes directly from imported parentage. The sow, "Manning Juliet" 306, was heavy in pig at the time of purchase, and has since farrowed a satisfactory litter. She won a first prize Tarce Show, 1924. Her full sister won first prize, Sydney Show, 1923, and first and champion at Coramba Show, same year.

The sow "Rosebank Rosy Queen" 113 was the champion Tamworth sow, Sydney, 1924. She won second prize in class sow over fifteen months, Sydney, 1923. She was bred at the Hawkesbury College stud. The sow "Blakeney Rose" won first prize, Sydney, 1924, in a heavily contested class, the sow, "Orara Lass," being the second-prize sow in same class. "Oban Miss" was also a runner-up in this class, she being by "Grange Dalkeith" 220, a Camden Park Estate boar.

The Poland-China boar, "Homeville Duke" 124, won first prize in his class, Sydney, 1924. His full brother won second prize, same class, whilst full sisters and brothers won numerous prizes at Sydney at both 1923 and 1924 shows. The sow, "Danesboro Winnie" 130, was the first prize sow with litter, Sydney Show, 1924, and is a high-class animal. A number of her litter were secured, as also were some other prize-winning Polands for the stud of Mr. J. H. Whittaker, of Broxburn, Darling Downs, Queensland, these pigs travelling to Queensland with same consignments as referred to in this article.

Berkshire Boar and Sows and Tamworth Boar and Sows.

Account Medical Superintendent, Dunwich Hospital, Queensland.

Berkshire Boar: "Conargo Skipper" 5737.

Berkshire Sows: "Dundas Madge" and "Margaret," "Wilmot Rene" and "Parramatta Queen," and "Joyce."

This consignment of Berkshires is now located at Dunwich Hospital, Stradbroke Island, and forms the nucleus of a new stud at that Institution. The Berkshire boar, "Conargo Skipper" 5737, is a son of the champion Berkshire sow, "Conargo Topsy" 4228. This sow was reserved at the stud sales at 120 guineas. She also won first and champion, Sydney Show, 1921, first prize for group consisting of Berkshire sow and three of her female progeny, Sydney Royal, 1924; also special first prize as one of a group of five best Berkshire pigs on the ground, same show. "Conargo Skipper's" sire, "Conargo Dick," is also a very successful stud animal, and has been of great value in building up the herd from which he comes—that of G. R. Limbrick, of Langunga, New South Wales. The sows "Dundas Madge" and "Margaret" were two of the pen winning third prize under four months, Sydney, 1924. They come from the stud of Charles Dawson, of Dundas, New South Wales, a man who has proved that there is a decent living for a man in running a dozen or more sows on a small holding, and collecting refuse food from hotels, cafés, &c. These sows were well developed, and should make up into fine breeders. The sow "Wilmot Rene" was bred in Tasmania, from which State she came to the Sydney Show. Her parents are consistent prize winners there, a boar from this stud a couple of years ago realising 65 guineas at the Sydney Show. The sows "Parramatta Queen" and "Joyce" were bred at Parramatta Hospital, New South Wales. For further reference to their prize records, &c., see details of pigs sent to Kairi State Farm, they being full sisters to "Parramatta Peg."

In Tamworths, Dunwich Hospital secured as fine a lot as has ever been introduced to this State, and as the nucleus of a Tamworth stud now being developed at this hospital would be hard to beat. The boar, "Blakeney Ross," won first prize Sydney Show, 1924, and is developing into a champion. His dam, "Pampoolah Ruby," has produced many prize winners. She was the second prize sow in aged Tamworth sow class, same show, and is included in the purchase of sows for Dunwich.

Two sows, "Hawkesbury" 2091 and 2093, were included. They came from the Hawkesbury College stud, and are really choice animals, specially selected and of the modern type. Two sows, "Orara Goodhope" 253 (who has since farrowed eight healthy good-type pigs) and "Orara Sunbeam" 309 (also now rearing her litter), from the stud of C. J. Franks, of Coramba, New South Wales, should also prove themselves specially suited to the conditions at Dunwich, where they will be mated with the boar referred to above at an early date.

Another sow, "Winburndale Sedate" 326, the second prize sow Sydney, 1924, from the stud of Mr. F. Ebborn, of Raglan, New South Wales, is a very useful type and should prove a great breeder. The sixth sow was "Pampoolah Ruby" 145, referred to above.

Young stock from these animals will be available at a later date at Dunwich Hospital, and particulars regarding these can be obtained from the Medical Superintendent at any time.



PLATE 29.—FIRST PRIZE DUROC-JERSEY BOAR, SYDNEY SHOW, 1924. A. N. WHITE'S "BLAKENY RUBS."

This boar was sold at the stud sales to W. H. Bruce, the well-known South Australian studbreeder. This boar is a direct representative of the Duroc-Jerseys imported from Canada by Mr. F. G. Brown, of "Good Luck Farm," Toogoolawah, Queensland.

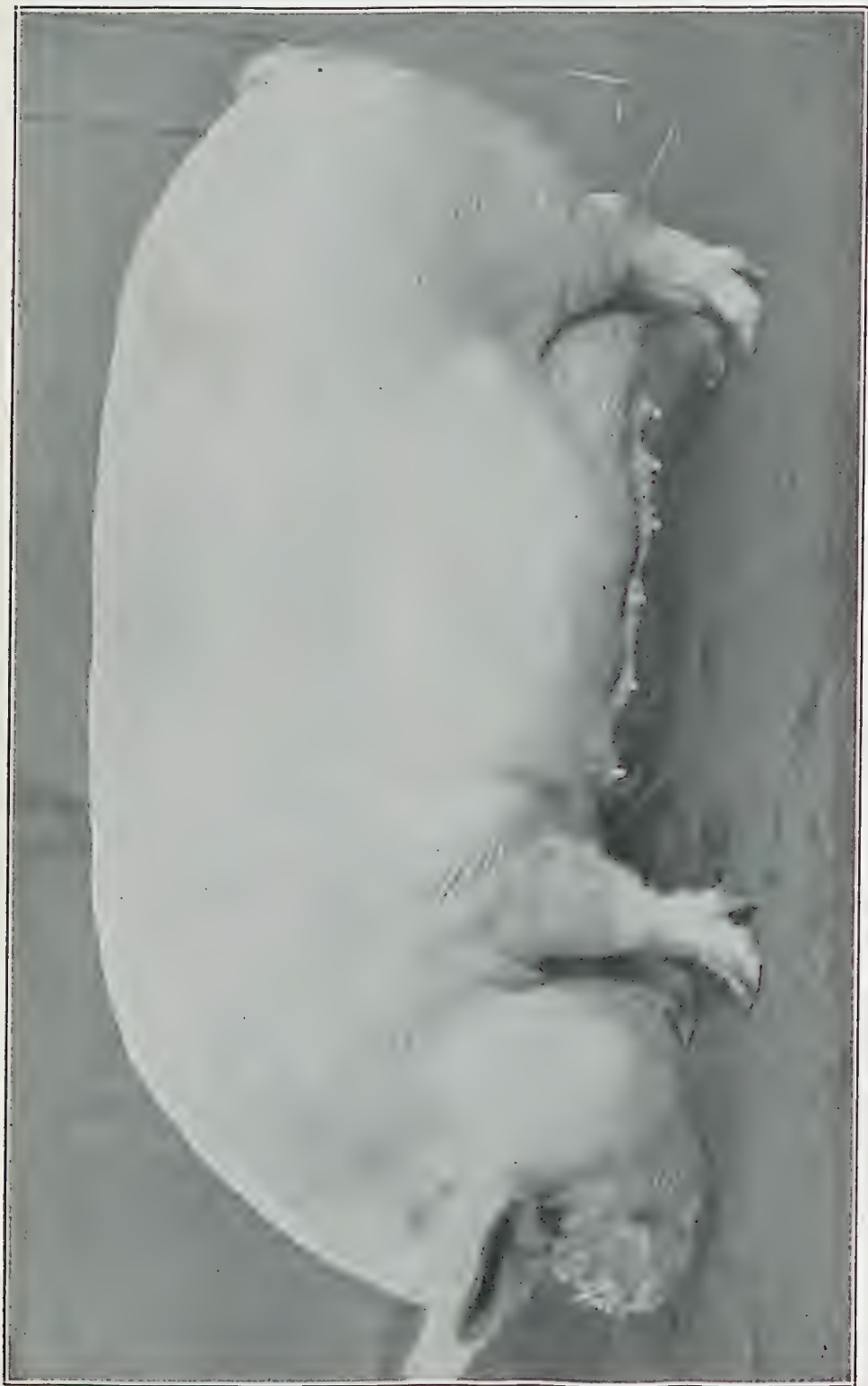


PLATE 30.—THE CHAMPION MIDDLE YORKSHIRE SOW, 1924, RALPH JOYCE'S "LEONA" 2113.

She also secured the Championship at Melbourne Royal Show, 1923. She has been an exceptionally good breeder and mother, never having killed any of her suckers and never having less than eleven pigs in her litter. She represents the very best in the Middle Yorkshire breed.



PLATE 31.—FIRST PRIZE MIDDLE YORKSHIRE SOW WITH LITTER, SYDNEY SHOW, 1924. RALPH JOYCE'S "KYABRAM BEAUTY" 2465.

The litter is sired by "Coleraine" 2234, who won the Progeny Group Prize, Royal Show, Melbourne, 1922. This litter was line bred. The sow only had the seven pigs, but made an exceptionally good job rearing them. The small black spots on the backs of the suckers are sale (paint) marks only. An exceptionally well developed lot.

DANISH AGRICULTURAL TRADE.

The exportation of bacon, butter, and eggs from Denmark during 1923 was the highest on record, shipments of bacon having amounted to 375 million pounds, of butter to 245 million pounds, and of eggs to 67 million dozen. This compares with the pre-war average of 298 million pounds of bacon, 221 million pounds of butter, and 38 million dozens of eggs; an increase of 26 per cent. in bacon, of 11 per cent. in butter, and of 76 per cent. in eggs.

The net return to the Danish farmer during 1923, however, was not as satisfactory as the above figures would indicate. While butter and eggs yielded a considerable profit, this was more or less offset by the low net returns realised from bacon, inasmuch as prices for both corn and barley have increased, while pork quotations have decreased.

Denmark must import practically all of her agricultural machinery requirements and other manufactured products, and her animal feedstuffs requirements. The high prices of these articles during recent years has resulted in a very unfavourable balance of trade for Denmark. Depreciated exchange rates and high prices in Denmark, together with the lower prices received for the agricultural commodities exported to the United Kingdom and Germany, combined to reduce materially the income of the Danish farmer for the year.

Danish success in foreign markets has been established upon a quality product. Prices received for Danish agricultural exports are usually on a slightly higher level than American goods can command in the same foreign market. Any attempt at increasing a market for American bacon, for example, in a market where Danish competition has to be met, must be based not so much on better prices as on a competition of quality and selling methods. Before and after the war, prices of Danish bacon on the British markets have always averaged from 2 to 10 cents per pound more than the American. The increasing exports of Danish butter to the United Kingdom, where it receives top prices, is another indication that a quality product can hold its own market.

The foregoing notes having been extracted from the information published in Weekly Crop and Market Report issued by the United States Department of Agriculture, should be of considerable interest to Queensland pig raisers and manufacturers, as indicating the necessity for strict attention to quality in considering the possibility of opening up export outlets for our bacon, hams, lard, and smallgoods. It also emphasises the fact that in competition with Denmark our manufacturers will have to stick to "quality goods" and "attractive get-up," combined with consistent effort in regulating supplies in order to secure a permanent footing on those overseas markets for Queensland hams, bacon, &c.—E. J. SHELTON, H.D.A., Instructor in Pig Raising.



PLATE 32.—A GROUP OF PRIZE-WINNING BERKSHIRES AT TOOWOOMBA SHOW, 1924.

Note the even quality and type.

They are the property of Mr. J. W. Handley, Bon Vale, Murphy's Creek, Q.

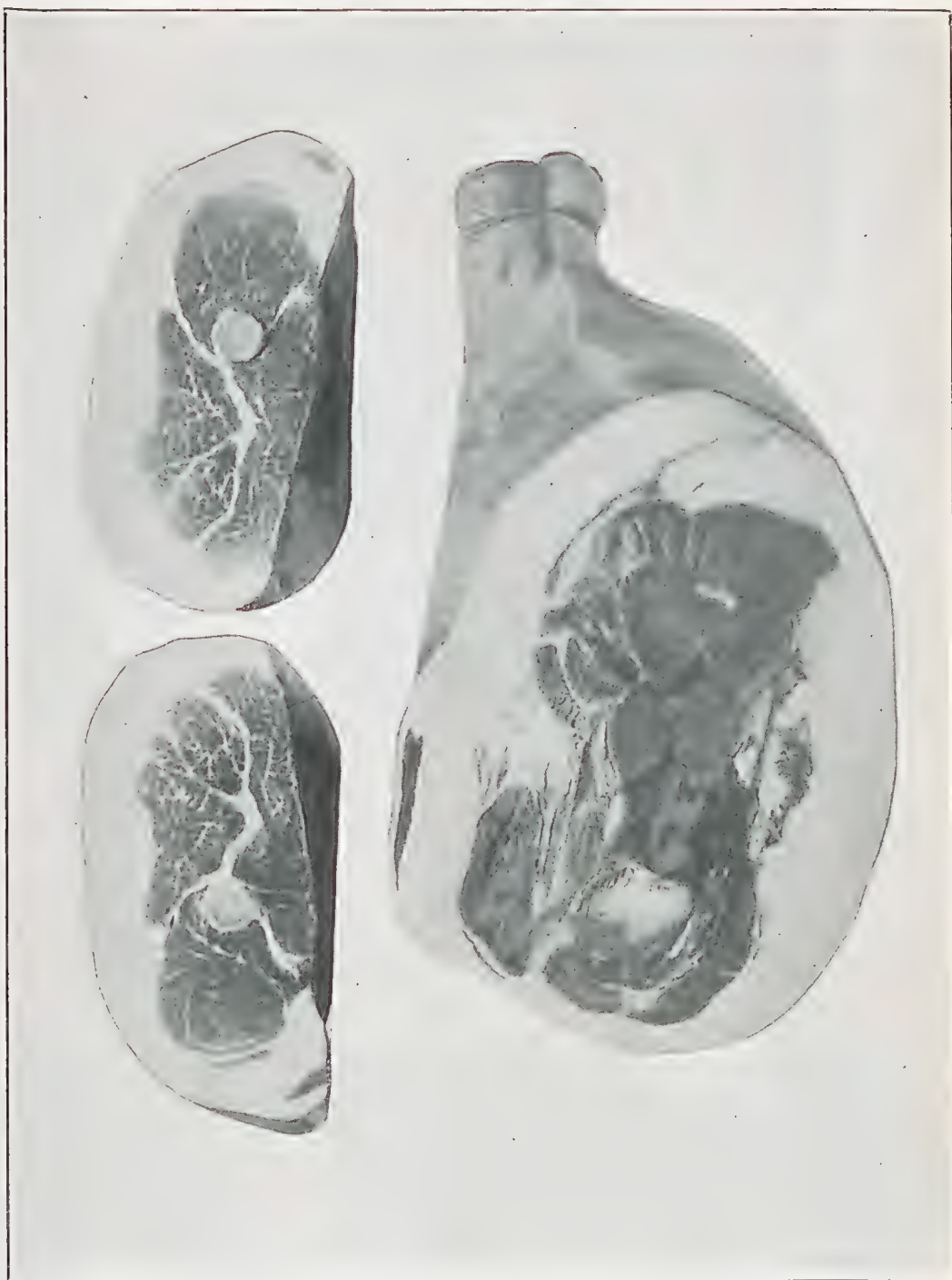


PLATE 33.—QUALITY HOLDS ITS OWN MARKET—A CHAMPION PRIZE-WINNING HAM.

Note the even distribution, the "marbling" of the fat and lean meat, the fine texture and quality of the flesh, its appetising appearance—the result of careful selection and up-to-date methods of butchering and curing—and the neat, attractive manner in which this ham was prepared. There is no reason why Queensland should not produce Hams as rich in quality and as attractive in appearance as this.

MIXTURES FOR PIGS.

CHARCOAL, WOOD ASHES, AND LIME.

E. J. SHELTON, H.D.A., Instructor in Pig Raising.

It is essential in a proper system of feeding pigs that provision be made for a supply of charcoal, lime, and other substances.

The following mixture has proved very suitable for this purpose, and as the ingredients are reasonable in price and not difficult to obtain it should not be difficult for any farmer to provide a supply for his pigs at all times. The recipe is as follows:—

Mix:—Charcoal, 20 lb.; hardwood ashes, 20 lb.; coarse salt, 8 lb.; air-slaked lime, 4 lb.; flour of sulphur, 4 lb.; powdered copperas (sulphate of iron), 2 lb.

Prepare as follows:—First mix the lime, salt, and sulphur thoroughly, then add the charcoal and ashes. Dissolve the copperas in two pints of hot water and sprinkle over the whole mass, mixing it thoroughly.

Keep some of this mixture before the pigs at all times in a strong box securely fastened in a weather-proof corner of the sty. Provide ample clean, cold water at all times.

Lime water should be added to the morning feed, using half a pint to each two gallons of food. It will also pay to add a few ounces of sterilised bone meal to the food of the growing pig. This meal can be ordered specially for this purpose from any of the leading dealers in artificial fertilisers. It may seem that these condiments are expensive and unnecessary, but in actual practice they will give a handsome return on the outlay, though it might be difficult to demonstrate this in actual pounds, shillings and pence.

These mixtures will satisfy the pig's desire for mineral substances, and will prove of added value as a tonic and appetiser. Salt licks also are becoming more popular each year.

Minerals are just as important in the growth and development of the pigs as are proteins, carbohydrates, fats, vitamins, ash, water, and other nutrients, and more attention should be given to their provision, because as a rule insufficient quantities are present in the ration.

All pig rations, of course, contain some minerals, but there are practically no pig rations, unless specially prepared, that contain an adequate quantity to meet the requirements of the pig's body. Pigs need minerals for the building up of bone, for making muscle, for cell division, and for the carrying of innumerable physiological functions.

Without minerals, growth and development will be restricted and the pigs will be less profitable. Many pigs suffer because they receive inadequate quantities of minerals, but no pigs suffer because too large quantities are given to them. Consequently, we should see that our growing pigs have access at all times to a good mineral ration balancer.

Corn Cob Charcoal.

A good use for the corn cobs (cores) that have always been allowed to accumulate on most farms and around piggeries, is to make charcoal of them. The cores in themselves do not make a good feed for pigs because of their high and coarse fibre content, and even if the whole cob (corn and core as well) is ground, it has yet to be proved that there is an added value in them. The core is practically indigestible fibre that only burdens the pig's digestive organisation and causes indigestion.

After the pigs have taken all the corn from the cob, however, the waste cores can be raked together into a pile and burned to the point when it is all a live mass of coals. Water should then be sprinkled over the pile to put the fire out and the partially charred cores gathered up for the pigs. If there are any other "chips" available or any old corn husks these should also be gathered and burned and added to the charcoal made from the cores.

Some of the farmers in the Rivers district of New South Wales have for years followed this practice, and in these days when suction gas plants are in use to such an extent quite a large trade has sprung up for the charcoal burners. In this case large pits are dug in the ground and suitable lengths of logs are pulled into these; they are then fired and after a time are covered with earth. In a few days' time a good class of charcoal results. These farmers have been making good money and at the same time cleaning their holdings.

It should not be forgotten, of course, that all pigs should be allowed abundant range over good, green pasture to have the advantage of plenty of green food, cornstalks, sorghums, soft sugar-cane, root crops, grasses, &c., as well as their usual supply of milk.

Our illustrations are from the Warren State Farm, where the manager has wisely adopted the practice of saving as much wood ash and charcoal as possible, and feeding it to the Berkshire pigs which run on the farm.



PLATE 34.—GATHERING AND BAGGING CHARCOAL AND WOOD ASHES IN THE COURSE OF CLEARING OPERATIONS AT WARREN STATE FARM, QUEENSLAND.



PLATE 35.—CLEARING OPERATIONS AT WARREN STATE FARM, Q.

After bagging the charcoal the surplus wood ash is raked up and distributed over other areas. It also has a value as a constituent in mineral mixtures for pigs.

THE PRICKLY-PEAR COMMISSION.

PLANS AND PROCEDURE.

The permanent judicial and administrative tribunal created recently and designated the Prickly-pear Land Commission is the outcome of recommendations submitted to Parliament by a Royal Commission appointed to inquire into every phase of Queensland's prickly-pear problem. The new authority, composed of three members (Messrs. W. L. Payne, F. D. Power, and William Purcell) is entrusted with full and sole control of all matters pertaining to pear infestation within the State. All pear-infested holdings of varying tenure are now under the jurisdiction of the Commission, and one of its first duties is to revise and harmonise the conditions governing the different tenures. Subjoined is an interesting account of some means it has adopted in combating the cactus curse.—Ed.

The Prickly-pear Land Commission has now entered upon its work of checking the spread of pear, testing methods of eradication, and evolving means for reclaiming infested areas that are now lost to production.

Simplified Judicial Procedure.

In order to facilitate its work the Commission has evolved new Rules of Court, and simplified legal procedure. The straightforward simplicity of the new procedure should recommend itself to all landholders. On electing to have their holdings considered by the Commission, landholders are supplied with printed question forms, the answers to which, written in by the landholder, together with official reports, will supply the Commission with all the information required to arrive at a decision in each case. The settler supplies these answers in the quiet of his own home, building up his case point by point without the disturbing atmosphere of the open court. There are no fees to pay, and agents or advocates are unnecessary. If, however, the settler prefers to appear before the Commission, either in open court or in chambers, in person or represented by an agent, he is perfectly free to do so. It is an advance step in simplified court procedure which should be welcomed, and only by its adoption can the Commission hope to dispose of a vast volume of work. It is provided that settlers desiring to have their holdings considered by the Commission must make application within six months after the commencement of the Act. The selector can do no possible harm by coming under the administration of the Commission, and he may reap some benefit by doing so. Although there is much to be done in a judicial way the Commission has made it quite plain that it has one settled objective: the destruction of prickly-pear. To this end, it is concentrating on administrative work in a thorough and practical manner, as it is recognised that with an enemy like the pear that spreads so rapidly any "wait-and-see" policy would be fatal.

Methods of Pear Eradication.

At this juncture, it would be unwise to assume that the cochineal insect has solved or will solve the question of pear eradication. Up to the present its work has been satisfactory and promising. Biological activities have an important place in the pear campaign; they are likely to prove a valuable ally in dealing with the denser infestation, and, recognising this, the Commission has been in communication since May last with the Commonwealth authorities controlling these biological researches, urging definite action in this respect. The Commission recommends that these experiments should be continued and intensified until every means of eradication has been thoroughly tested. The Commission has also elaborated arrangements for the employment of the best known, cheapest, and most effective poisons to deal with pear in comparatively lightly-infested country.

Best Poisons Available.

The most effective poison in use to date is arsenic pentoxide. It is recommended by the Commission for spraying young pear and injecting bunches of scattered growths. A tender has been accepted for the supply of 100 tons of this poison, which will be made available to settlers at 9d. per lb. Arsenic pentoxide before using is mixed with four times its weight of water—2½ lb. of poison to 1 gallon of water—so that the price of the actual working mixture works out at about 2d. per lb.

Another effective poison, already well known to landholders, is Roberts' Improved Pear Poison. The Commission has arranged with the proprietors to purchase the whole of their Queensland output for twelve months, and is making the poison available to landholders at 4d. per lb., with containers free of charge. Broadly speaking, the suitability of the two poisons may be summed up—Arsenic pentoxide for spraying young pear and injecting scattered bunches; Roberts' Improved Pear Poison for spraying old, tough pear and dense masses. With these two poisons available at reasonable prices, the settler is well equipped for the fight against the pear.

To secure these poisons, the settler must make application on the prescribed forms which are to be had from any local Land Office. On the back of these forms is printed a deal of poison information which the landholder will find useful. It is understood that the Commission urges landowners to make early application for these poisons so that they may gauge requirements for future supplies.

Buffer Areas.

The system of buffer areas now engaging the attention of the Commission will, when completed, play an important part in keeping the prickly-pear within bounds. The work is of some magnitude and will take time.

Assistance to Local Authorities.

As a further measure to ensure the effective co-operation of the Local Authorities, the Commission is granting those bodies a subsidy of £2 for every £1 spent by them in pear destruction, and arranging for co-ordinated effort for the purpose of eliminating overlapping and waste.

Closer Settlement.

It is frequently urged by persons unacquainted with the lands of the State that closer settlement on the edges of the pear country will solve the pear problem. The fallacy of this, according to the Commission, can easily be demonstrated. For closer settlement there must be good land suitable for the purpose, but the edge of the pear country in the West often comprises second-class cattle country, requiring at least 20,000 acres as a "living" area. Even then, the proposition is not an attractive one. It is clear, therefore, that "closer settlement" offers no solution; as a matter of fact, experience points to the contrary. The settlement on land in areas too small to support the settler has repeatedly resulted in the neglect and abandonment of the country, and has been one of the many causes contributing to the spread of pear.

MILKING RETURNS, COLLEGE DAIRY HERD, JUNE, 1924.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			Lb.	%	Lb.	
College Mignon ..	Jersey ..	24 Mar., 1924	570	5·7	38·40	
College Prima Donna	Friesian ..	9 April, 1924	810	3·8	36·00	
Iron Plate ..	Jersey ..	3 Mar., 1924	600	4·3	30·00	
College Desire ..	Ayrshire	28 May, 1924	540	4·4	29·76	
College Meadow Sweet	Friesian ..	17 Mar., 1924	660	3·5	27·00	
Yarraview Village Belle	Guernsey	3 April, 1924	480	4·8	27·00	
Fair Lassie ..	Ayrshire	29 Oct., 1923	480	4·4	24·60	
College Sunrise ..	Jersey ..	3 Jan., 1924	480	4·4	24·60	
Lady Peggy ..	Ayrshire	24 April, 1924	570	3·6	23·70	
Netherton Belle	"	30 Oct., 1923	450	4·4	23·10	
Hedges Nattie ..	Friesian ..	21 Nov., 1923	510	3·8	22·80	
Miss Betty ..	Jersey ..	30 Oct., 1923	390	4·9	22·50	
Sweet Lassie ..	Ayrshire	27 Mar., 1924	420	4·2	20·70	
Myrtle Blossom	"	9 Mar., 1924	510	3·4	20·10	

Bureau of Sugar Experiment Stations.

FIELD REPORTS.

The Northern Field Assistant, Mr. E. H. Osborn, reports under date 24th July, 1924, as follows :—

Herbert River.

Cane Varieties.—Only the following varieties have been approved for local planting:—Badila, Goru, H.Q.409, H.1900, and Q.813. H.Q.409 has been planted out rather extensively this year. It is a cane of high density and is said to ratoon well. Mr. G. Geeson, of Ripple Creek, will be cutting a crop of fourth ratoons during the season and expects to get about 15 tons per acre. Probably this grower's success in ratooning lies in the way in which his ground is worked. He is a great believer in subsoiling. His farm has been under cane for many years. H.Q.409 is a slow striker, and evidently should be planted very early or else very late, and without too much covering. It also seems to do well in heavy soil.

Another cane that has become popular here lately is Q.813, mainly on account of its good striking properties and very quick growth. It can be planted either early or late, in poor or medium heavy soils, and besides carrying a high density also ratoons well. Mrs. E. P. Lyons, of Macknade, has just harvested a 35-ton crop of plant Q.813, and has also some very good first ratoons.

Among other varieties some magnificent E.K.1, Q.855, Q.813, and H.109 were noticed upon Mr. L. Roarte's Cordelia Farm. The two first-named canes are exceptionally good; in fact, the E.K.1 was one of the best samples of its variety that the writer has seen. All the cane on this farm looks well, as the ground is kept in a state of thorough cultivation by the owner, who limes, ploughs in all trash, green manures, and uses artificial fertilisers. His young plant cane, mainly Goru, looked a picture when last seen. This land has also been continually under cane for many years, but is probably growing better average tonnages now than it did years ago.

Lower Burdekin.

This cane centre was visited early in July, when the outlook was very promising. In Ayr itself, a large number of new and substantial buildings were being erected, and by the large number of visitors met with it is easy to see that the present through train service with Brisbane has helped materially to advertise the natural resources of the Lower Burdekin. The three local mills were operating very smoothly, and all anticipated a very fair season.

The rainfall for the year aggregated to date 28.93 inches, or easily more than twice last season's total fall, and the crops in general looked very fair.

Very large areas of healthy-looking young plant cane were to be seen. The strike had been a remarkably good one throughout the cane areas. Two of the largest acreages of young plant are those of Hoey Brothers and Mr. W. Payward. The first named have already planted 110 acres and are now preparing 50 acres more. Mr. Payward has some 80 odd acres well through.

Both these farms look extremely well. Tractors are, of course, responsible for the above large plantings, Messrs. Hoey Bros. ploughing day and night to get their cane planted. Another use for tractors in this area is for pumping power. Many farmers of limited means have greatly benefited by their use since they became so very popular on the Lower Burdekin.

Cultivation work in general reaches a very fair standard of efficiency in this district, the growers in general being very keen upon trying out any new implement that will give results.

Here, however, as in many other of the sugar areas, the lack of green manure is noticeable. Of course it means irrigating for manuring crops, but the growers who have done so claim that they get the results. Two, for instance, are Messrs. Payward and H. Todd.

Where green manuring has been carried out the texture of the soil is certainly improved, and young plant cane growing thereon looks uncommonly well.

It cannot be mentioned too often that, apart from the nitrogen accumulated from the air by a normally-grown bean or pea crop, the great value of the humus from these crops, and also trash when ploughed under (more particularly in such a dry district as the one now under review), cannot be over estimated; especially when we remember the well-known capacity of organic matter to conserve moisture in dry times.

Fertilisers.—The use of fertilisers is becoming more popular in the area, and a fair quantity is now used annually; but although results have been satisfactory, the full benefit to be derived will never be complete until preliminary cultivation is more thorough. Without that, neither the soil nor the particular brand of manure is given a fair chance to do its best.

CANE CROP ESTIMATE.

The excellent season following on a dry period, combined with the fact that the acreage under cane has been rapidly increasing, will account for what will probably be the record yield of sugar in Queensland this season.

The Director of Sugar Experiment Stations states that, from figures he obtained during his recent Northern trip, it is now possible to give an approximate estimate of what the crop may be. Roughly speaking, it now appears probable that a yield of 330,000 tons of raw sugar may be looked for in Queensland. This figure is not so high as anticipated earlier in the year, but the continued showery weather in the North is expected to increase the tons of cane required to make a ton of sugar. Then, a great deal of arrowing has taken place, and a good deal of cane about Innisfail and Babinda was cut late last year and early in this, and is backward.

The above, with a yield of 20,000 tons for New South Wales and 2,500 tons in Victoria, will give a total output of 352,500 tons for Australia, a good deal more than is required for the consumption of Australia, so that the export of sugar will have to be undertaken.

There has been a great increase in sugar production north of Townsville during recent years.

The previous record was in 1917 when 317,000 tons of raw sugar were produced. A portion of this, some 10,000 tons, was lost in the 1918 cyclones.

CANE PESTS AND DISEASES.

Mr. W. Cottrell Dormer, Entomologist, reports under date 28th July, 1924, as follows to the Director (Mr. H. T. Easterby):—

BABINDA DISTRICT.

Diseases.

Four important diseases were observed in the district—these are Leaf Scald, Leaf Stripe, Top Rot, and Root disease. Leaf scald is to be found scattered throughout the district. For the most part it is doing but little damage, but nevertheless is a source of great potential danger to the growers, as has been pointed out by different authorities during the past eighteen months. Growers could do a great deal towards exterminating it if they would destroy all stools showing the characteristic symptoms while they are young and can be easily detected. Badly affected stools can be readily recognised by the light green and white striped colouring of the outer leaves and the almost pure white colour of the innermost ones. All the leaves are stunted and curled at the tips, and often look as though they had been scalded. Even if only these badly-diseased stools were destroyed it would be a step in the right direction. The disease was found to be particularly bad on one or two farms in the locality known as East Russell. On these farms diseased stools reached to as high as 10 per cent. to 12 per cent. In each case, however, it was noticed that the cane had previously received some severe check, such as drought or flood, so that the already weakened state of the plants probably went a long way in making the disease more virulent. Leaf Stripe disease was observed in its early stages in a small block of B.208 on one farm at Frenchman's Creek. On another farm in the same locality Top Rot disease has done rather severe damage in some Badila cane. Throughout the whole district Badila was found to be affected to a greater or less

extent by what is probably a root disease. Affected stems are "trash bound"—i.e., the trash clings to the stick, bear adventitious aerial roots, are faded in colour and taper off unnaturally at the top. Usually only a few sticks are thus affected in a stool, but sometimes the whole stool is stunted. Examinations were made of a number of affected stalks, and it was found that quite a big proportion were primary shoots. In many respects this malady resembles Top Rot, but it is distinguishable from the latter since the leaves do not usually turn yellow and die; they remain stunted but green, though dead tops are occasionally to be seen. In some farms the weight and density of the crop have been seriously diminished by this disease. It has been observed that trashing affected cane three or four months previous to cutting has helped it on a great deal. Some growers expressed concern at the quantity of spots and markings to be seen on some of their canes. These were mostly due to Leaf Spot fungi (*Cercospora* spp.), and are of no great importance. Some canes when infected do indeed look to be seriously diseased, and the outer leaves die off somewhat sooner than in healthy stools. The effect on the plant is unappreciable; some varieties are far more susceptible than others. E.K.28 is very susceptible. These leaf spot diseases appear to thrive best during the winter months.

Insect Pests.

The district as a whole seems to be very free from insect pests this year. Some of the more serious pests were observed and several of the minor ones, but in no instance were they found to have attained serious epidemic proportions. Grubs of the grey-back beetle have done slight damage in scattered localities, but especially about Merriwinni and Mooliba. Most of these grubs have "gone down" to pupate previous to emerging as beetles. On one farm at Merriwinni a patch of about 3 square chains of heavy ratoon Badila has been seriously damaged and most of the stools have fallen over. However, sufficient roots remain in the soil to preserve the cane from deterioration for some time to come. In most cases where grubs were found the soil appears to be quite open enough for fumigation under auspicious weather conditions. One grower has already tried carbon bisulphide as a fumigant, and from the point of view of mortality has obtained good results. This was done last year; this year the infestation was not sufficiently great to warrant further treatment. To obtain efficient results the growers should bear in mind that it is necessary to destroy the grubs before they do any serious damage. It is because many growers wait until their cane is badly affected before they fumigate that results are frequently disappointing. Another mistake often made is to use carbon bisulphide when the soil is very wet, in which case the fumes naturally do not travel sufficiently far to cause a high mortality amongst the grubs. Grubs of *Lepidiota frenchi* appear also to have done slight damage, though the larvae were not found. This was on a farm at East Russell, where some young plant Badila withered up in the leaves, and received a severe check in small patches during September and October of last year. The cane afterwards recovered, but is still a good deal backward. This would correspond with the rising to the surface soil of the grubs of the *frenchi* beetle at the commencement of the second year of their life-cycle, after having spent their first winter in a state of hibernation.

The cane beetle borer (*Rhabdocnemis obscurus*) has received a very severe check during the last couple of years. Its Tachinid Fly parasite is to be found established in every part of the district where Badila is the standard cane. It may be of interest to mention that early last year I visited a farm which was rather badly bored. Nine badly-bored canes were cut at random and carefully cut up. Each contained several borer grubs and some borer cocoons. Every one of those grubs contained maggots of the Tachinid Fly which were slowly destroying their hosts, and every cocoon contained the small brown egg-shaped pupæ of the flies. This means that not one of those borers would ever have reached maturity, which shows clearly how effective the fly can be when well established. Of course such results are not common, or else the fly would soon exterminate itself as well as its host. Dry weather and burning of trash have also undoubtedly been factors in the remarkable destruction of the borer during the last couple of years. The sugar-cane Aphis (*Aphis sacchari*) has been noticed during the last spring and autumn months by many growers throughout the district. The striking feature of this Aphis is that it is usually accompanied by a black fungus growth, which develops on the sugary secretions deposited on the leaf by the insect as it sucks the sap. A good description of the Aphis, and of the fungus, is given in the Entomologist's report for June, which Babinda growers should study carefully. Of other minor pests noticed I will only mention the Army Worm and the Wire Worm. The former (*Cirphis unipuncta*) was reported to me as having done slight damage on one farm in the Palma locality, while the Wire Worm (*Monocrepidius* sp.) is reputed with having been occasionally destructive in some low-lying country at Mooliba.

The Director of the Bureau of Sugar Experiment Stations (Mr. H. T. Easterby) has received from Mr. E. H. Osborn, Northern Field Assistant, the following report, dated 10th July, 1924.

Proserpine.

When it is remembered that the total rainfall for this area for 1923 amounted to only 27·49 inches, against an average of 75 inches, and that 5 points represented the October, November, and December falls, it is surprising how marvellously the crops have recovered under such unfavourable conditions. Present indications point to a very fair crop for this season.

At Banana Pocket, particularly, seasonal prospects are bright. Much solid work has been put in here lately, and the improvement since my last visit here eight months ago is very noticeable. In such a new area the crops ought to look well, and some very heavy tonnages of H.Q.426, N.G.15, Q.1121, M.1900, Q.813, and D.1135 were seen. Some of the Q.813 (February planted) looked extremely well. The stools were good and the length and thickness of cane very fine. This cane appears to be very popular in the Proserpine area. Some very solid D.1135 was also seen in the neighbourhood, as well as some really splendid Badila, both plant and first and second ratoons.

Two tractors are in use in the Pocket, the owner of one (Mr. J. Smith) speaking in glowing terms of its usefulness. It is also very probable that a locomotive will be used this year to haul the cane from the Pocket to the siding upon the North Coast Railway at Thompson's Creek, thereby reducing the transit charges to the grower very considerably. Taking the Proserpine area as a whole its conditions are very promising. Better and more thorough cultivation is evident and larger areas are going under crop. About twenty-six tractors are now in use against the four or five that were there, say, a couple of years ago, and several more are on order. The new area at Bloomsbury was not visited, but it is reported that the cane there looks very well.

Diseases.—So far this area has been very free from disease. A couple of stools of Badila and one of Striped Singapore were noticed to be affected with leaf scald, while on another farm, mosaic was noticed in an odd stool or two of Singapore. It cannot be emphasised too strongly the absolute necessity of growers using none but the very best seed for planting, casting aside any that does not seem thoroughly sound and healthy looking. The following figures of last year's crop are interesting:—

Variety of Cane.	Per cent. of Crop.	Average c.c.s.
Badila	8·3	14·4
H.Q.426	28·3	14·0
Striped Singapore	3·6	13·9
Q.813	17·9	13·8
Other varieties	10·1	13·7
Malagache	8·8	13·0
D.1135	4·4	12·9
M.1900	9·1	12·8

Of the canes classified as other varieties, the following extra particulars are given:—

Variety.	No. of Samples.	C.C.S.
Violet	17	15·0
B.147	10	14·8
Q.1121	21	14·2
Q.116	46	13·9
B.208	15	12·7

Weeds.—It will be remembered that in some recent sugar notes upon the Mackay and Burdekin districts, Mr. Cottrell Dormer, of this Department, spoke of a certain cane-stunting weed noticed. Mr. Thoroughgood, of Kelsey Creek, having reported that odd stools of D.1135 plant were dying out from no apparent cause, a sample of the weed was sent to Brisbane for identification, and the reply was that the weed seemed identical with the Mackay one, and that it was advisable to get rid of it as soon as possible. Luckily the weed is a delicate one and should be easily eradicated when first noticed.

Grubs.—Grubs were noticed in several places, particularly at Kelsey Creek. There they had severely damaged a fine crop of Q.813, and in another place some Badila ratoons. In this particular area a block of D.1135 was eaten out last year, and was replanted during December with Q.813. So far this block looks well, and it seems that the late planting will prove a success, although as a rule Q.813 does not stand up to grubs too well, its rooting system seeming fairly shallow.

Bowen Areas.

Unfortunately, the very dry conditions of last year militated against planting in this area, and in consequence the crop to be harvested this season will be small. A much larger acreage will be cropped next year. Several good crops were noticed, mainly those of Messrs. Hildebrand, Stacklerotti, Darwin, and R. Miller, the latter having some real good-looking first and second ratoons, mostly N.G.24 B (green Goru). Some seven months old plant N.G.15, B.208, M.1900, 24B and Malagache also showed splendid growth. This crop looking so much above the general average is accounted for by the fact that plenty of water had been used, and also the soil is very good.

Rollingstone to Mutarnee.

At Rollingstone Mr. S. McCree hopes to harvest some 50 odd acres of plant cane, amongst which is some really first-class Badila. He hopes to have another 30 acres next year. This grower is also laying down a tramline from the farm to the siding across the creek. Further up the line, at Mutarnee, a very heavy crop of Badila of splendid growth and colour was noticed upon Mr. C. Barney's farm. Some 150 tons of this cane has been sold for plants to Giru and Gumlu, and should be a good change.

At Mr. V. Tealby's place some remarkably good first ratoon Clark's Seedling cut last October was noticed. One stool growing under "paddock conditions," intended for the Townsville Show, carried thirty-five sticks of probably between 7 and 8 feet of cane.

Bambaroo to Yuruga.

Settlement has developed rapidly hereabouts during the past twelve months, and the number of settlers is steadily increasing. Taking all the growers between Rollingstone and, say, Teobauna, it is probable that they number about 100, and will send in, say, 10,000 tons of cane to Invieta this year, with the prospects of a very much larger tonnage for 1925.

Several very nice plots of cane were noticed near Bambaroo, mostly in a very well kept condition, and showing good cultivation. The largest block thereabouts would be a 20-acre paddock of young plant cane owned by Salvetta and Co.

At Yuruga, Mr. J. Holland intends harvesting some 14 acres of plant cane for this year, while some 28 odd acres have just been planted mainly with Badila, which looks well. Mr. Holland has purchased about 1½ miles of portable tramline, and intends bridging Station Creek to connect with his farm.

The following rainfall figures are interesting:—

			Rollingstone.		Bambaroo.		Ingham.
			Inches.		Inches.		Inches.
January	..	..	7.99	..	10.18	..	7.39
February	..	..	9.35	..	9.02	..	11.73
March	..	..	21.31	..	13.97	..	15.11
April	..	..	6.89	..	2.39	..	9.77
May	..	..	..	..	..	..	7.9
			—		—		—
Total	..	..	45.84	..	35.56	..	44.79

Herbert River Area.

When this district was visited during the first week in June, harvesting operations were in full swing, and everything pointed to a record crushing season. A very large area is already under cane, but judging by the large quantity of young cane to be seen this will be exceeded by 1925, and it is evident that the local mills will not be short of cane for some years to come. It will be noted by the rainfall figures that up to the time of writing the fall had been light, but conditions have changed, and later beneficial showers have helped the young growth along considerably.

In the cane area, in general, cultivation methods have improved, but there is yet room for improvement, particularly in respect to liming and green manuring. As lime may be obtained so reasonably in the Herbert it is surprising that more is not used. The use of fertilisers has increased considerably, but results would be much enhanced were liming and green manuring more popular.

The Southern Field Assistant, Mr. J. C. Murray, reports as under (10th July, 1924):—

Brooloo.

The township is the terminus of the Mary Valley line. Practically from the time the train leaves Gympie, fertile agricultural land is traversed. Belts of heavy scrub, accessible to cultivation when cleared, are still standing, and at intervals prosperous looking banana plantations afford evidence of a flourishing industry. Cane farms occur at intervals up the valley, but, as yet, there is no group of farmers growing cane solely, as, say, at Bundaberg.

This year's crop is making a good showing. Mr. Bath, the teacher at the local State school, takes an active interest in canegrowing and has a block that will harvest well. The Q.813 is the best. Other varieties making good growth are H.Q.285, D.1135, and M.1900 Seedling.

The farmers, owing to the proximity of dense scrubs, have some trouble with the wallaby pest. The following method of extirpation is worth trying:—

Take a pint of pollard and mix into a stiff mass with molasses, add a little oil of aniseed and poison with arsenic. Make a drill down the cane rows and drop in the mixture at intervals in quantities about the size of marbles.

The soil around Brooloo is volcanic on the hills and alluvial on the flats. Most of the soil cultivates and drains well and has a slightly acid reaction.

In view of the number of live stock raised in this district, the farmers should find it profitable to grow forage cane. Owing to the distance from the mill, growers are advised not to plant cane too extensively, but to produce on limited well-cultivated areas.

Cooroy.

Although the farmers here contemplate growing cane more extensively, at present there is only a small acreage. A meeting of farmers interested was held a few weeks ago to discuss mainly the possibility of having a derrick erected for loading at Cooroy Station. No loading facilities and bad roads are effective drawbacks to cane production. The Cooroy district is suitable for sugar-cane growing, as the soil is good and the rainfall abundant. It is not advisable, however, for farmers to start planting on land where they cannot ultimately use the plough.

Two varieties of cane doing well in the Cooroy district are H.Q.285 and D.1135. Farmers will probably find these canes the most profitable. The first named is susceptible to frost and should be planted on the higher land.

Yandina-Maroochy District.

The cane looks very vigorous and healthy in these areas, and new farmers are coming in from other parts of the State and from New South Wales.

The varieties most generally grown are H.Q.285, Q.813, D.1135, and N.G.16. There is, however, a large number of other canes growing, most of which have been discussed in previous reports.

Disease was showing at intervals, principally the infection known as "striped leaf disease." In combating this the growers are urged to be careful in plant selection, and before cutting sets, to go through the field and tie a band of trash on any suspicious looking stool, for the guidance of the men cutting.

Care should be taken to avoid, if possible, canes that are not good harvesting and milling varieties. Uba is a bad harvesting cane owing to its thin sticks and very often adhesive trash. If a variety is a bad milling cane, the efficiency of the factory is lowered and the whole of the suppliers suffer.

Gumming disease was not met with in these areas, but, in view of the fact that there are plants being introduced from the Northern Rivers of New South Wales where this disease is prevalent, the following brief description may be of use:—Apart from the gum exuding on a cut surface this ailment can be recognised in affected cane by the appearance of the top. This will be rotten or dead and the shoots will be dry and snuff-coloured.

The farmers in these areas are recommended to try the use of green manures on the higher lands, and lime on the heavier river flats, to improve the texture.

Mullett Creek.

A few farmers here have cane growing, and the present crop looks promising. For the greater part scrub land is being utilised, but there is a considerable acreage of good quality forest land within a 10-mile radius of Mullet Creek Railway Station.

The roads here are fair, and the haulage distance is not great; therefore, the farmers should do fairly well with the areas they have planted.

Cane varieties successfully grown are H.Q.27, E.K.1, E.K.2, E.K.28, Q.813, H.Q.285, N.G.16, and M.1900 Seedling. No disease was apparent. Cotton grows well on the lighter soil at Mullet Creek. Farmers would no doubt find a field of this fibre profitable as well as the cane.

Avondale.

A big crop should be harvested at Avondale this season. The plantation and farms have been cultivated excellently, and the growers are reaping the benefit accordingly. The varieties showing the best growth are Q.813 and H.Q.285.

Very little chemical fertilising has been carried out at Avondale, the land appearing to respond naturally after rain. It is probable that Fairymead could produce heavier ratoons by the use of molasses on these sandy soils. Molasses improves the texture of light soils, as indicated by successful experiments tried elsewhere.

There appears to be a tendency in the various districts visited to plant cane in preference to any other crop.

The Southern Field Assistant (Mr. J. C. Murray) reports to the Director of Sugar Experiment Stations (Mr. H. T. Easterby) under date 21st July, 1924.

Bingera.

In the Bingera area, of which Messrs. Gibson and Howes' mill and plantation are the centre, there is every prospect of a good yield. Crushing will probably continue until Christmas. Most of the varieties going to the mill are excellent from a factory point of view, although there will be a small percentage of Uba. Density will, no doubt, be low at the start of operations, as the heavy sweet canes are not fully matured before the end of September.

There is very little disease in the Bingera areas, although an indigenous fungoid parasite is attacking the roots of the 1900 Seedling in places where the cane is backward owing to poor soil conditions. There is certainly no cause for the alarmist reports that arise from time to time regarding widespread infections in these districts contiguous to Bundaberg. Mottling of the leaf is common, but disappears as more favourable growing conditions prevail.

Farmers might plant more H.Q.285 and E.K.28 than they are doing at present. The latter is worth more extensive planting.

Soil conditions in the Bingera areas are favourable for the production of a good crop of cane. The average reaction of the soil is slightly acid, but experiments prove that lime is not required, excepting in cases where the drainage is poor and the soil lumpy. Lime would then be of use to improve the texture of the soil.

Grub is causing small losses. One grower reports having ploughed in a crop of weed commonly known as "Stinking Roger," which had the effect of considerably checking the infestation. Evidently there may be a constituent in this weed that is either a poison or a repellent.

Gin Gin.

Crops are in good condition and should harvest an average of 20 tons to the acre. Frost has not seriously affected the cane, in fact, the winter has been extraordinarily mild. Cane varieties that are looking well and showing plenty of growth are M.1900 Seedling, Q.813, and D.1135. Black Innis is a good cropper on some Gin Gin farms.

Canegrowers are gradually extending their areas. Land that has been idle for years, excepting for grazing purposes is being ploughed up and planted. Some of the old varieties, Striped Singapore, and Rappoe have been introduced and are making good growth. In dealing with these canes farmers require to be careful in plant selection on account of their susceptibility to "gumming."

Mackay.

The countryside generally looks most prosperous, the roads are being improved, comfortable dwellings erected, and people are lessening distances by the use of cars. On the areas in the vicinity of Mackay township the cane is not so heavy as on some of the river soils, although the e.c.s. content will be probably higher. The cane is arrowing very freely in this area, although, as yet, the stick is smooth with no shooting

at the eyes. Serious disease is not in evidence, although in a small patch of E.K.1 symptoms of disease, probably Mosaic, were showing. The node of the cane was shrunken and wax was peeling off. The internode was badly cankered and flesh of cane badly destroyed. Cankers were heavily attacked by fungus, and eyes of cane almost non-existent. The rind was mottled. Growers are advised not to plant this variety, as it is, apparently, in the Mackay district, susceptible to this disease.

A parasitic weed is growing on the roots of the cane in places. The damage done is unimportant. Other noxious weeds and grasses are well under control. The cane grub is not occasioning the growers serious trouble in these areas. In the Mount Jukes region, one of the most picturesque spots in the district, the cane is making a fine showing. Dense jungle originally covered this land. The formation here is peculiar, there being a shallow layer of topsoil and a subsoil which appears at first to be clay, but on exposure to the air crumbles and works up into excellent condition.

Grubs are causing the farmers considerable loss here. This is very often the case where farms are surrounded by feeding trees. Practically the whole of the well-known varieties do well here, but the only one so far that shows resistance to grub attack is D.1135. However, growers who are not troubled with the pest should try Q.813, N.G.16, H.Q.283, and E.K.28.

The cane is very free from disease in this area. A sooty fungus is prevalent on the leaves of some stools of Uba. It is harmless in itself, but no doubt does indirect damage to the cane by preventing the leaf from functioning properly.

The farmers in this locality are hampered by very bad roads. The tramline from the Marian mill, however, goes through the settlement. All classes of citrus fruits do well, particularly the orange. The hill slopes carry some beautiful pine, while cedar, lignum vitae, and many other valuable woods exist. The main trunk line is about 6 miles distant.

Samples of typical soils were taken from this locality so that, on receiving the results of the analyses, the farmers will have a guide if they wish to do any fertilisation.

In planting it is probable that the best way would be, instead of cane-holing in the usual way with a mattock, to drive a bar down, loosen a little and plant the cane about 10 inches deep. If the cane is not planted deeply in this soil it falls down as soon as it makes weight. Canes grow very rapidly in this locality; too rapidly for the roots to hold them at times.

On returning to Hampden from Mount Jukes no conveyance was available to take us on to Marian so we walked across country, a distance of about 8 miles. There is a considerable area of cane growing on the country traversed. There is abundant water and the cane looks well. The soil is a dark loam, in many instances being typical of that prevailing at Maroondan. Lime and green manures would be beneficial on land of this description. Canes that should give the best results here are H.Q.285, Q.813, and 1900 Seedling. A number of farms were inspected on the north and south banks of the Pioneer, above Marian. Many of the growers were busy ploughing, planting, and fertilising. Here, again, green manures and lime would be beneficial. Both Mr. McHardie and Mr. Paul, of Marian, have demonstrated that the use of earth lime, of which there is a local source, gives excellent results. With lime of this description, anything from 2 to 10 tons per acre could be applied according to the nature of the soil. Previous tests taken from these soils show a slightly acid reaction. It would pay the growers in this locality to co-operate in getting supplies of this material. No doubt the mill authorities would assist them.

Farming Efficiency.

In relation to the sugar industry, farmers are prone to stress the point of raising the efficiency of the mill to the neglect of the primary point of raising the efficiency of farming. It would be difficult to get a 10 per cent. increase in the efficiency of a mill, but not impossible to get an increase of 10 per cent. in the efficiency of farming. This could be accomplished by careful plant selection, judicious fertilising, green manuring, and periodic use of lime. Changing of plants is also a good feature. The introduction of a number of drayloads of soil from a fertile block on to a poor one is often a useful measure.

A visit was made to a locality known as the Hollow, about 6 miles south of Mirani. There are a number of settlers here from Great Britain. The soil for the greater part is low grade, but accessible to the plough, and if properly worked would grow cotton, maize, fodder canes, and grasses, while some on the flats would produce sugar-cane. However, it is probable that only a most experienced farmer could make this land pay. It is stated that these settlers were badly advised in London. They are a good type of people, educated, some married, with families, and had a fair money reserve. People in England would be well advised, before coming to Queensland, to obtain reliable information from the Queensland Department of Agriculture.

SUGAR CROP PROSPECTS.

The Director of Sugar Experiment Stations (Mr. H. T. Easterby) has returned to Brisbane from a visit to the sugar districts of Bundaberg, Mackay, South Johnstone, Innisfail, Babinda, Cairns, Mossman, and Lower Burdekin. Speaking generally, Mr. Easterby said that excellent crops were in evidence in all districts visited except parts of Bundaberg. The promise in this district early in the year was good, but until quite recently little or no rain had fallen since March, and the crops, particularly on the Woongarra areas, had retrograded, and some of the mills had reduced their estimates. The recent rain would, however, have a beneficial effect on the whole district, although perhaps too late to much aid this season's harvest.

Mackay.

At Mackay conditions were good, and it is apparent that a much better crop will be harvested than has been the case for some years. The present estimate of the mills in this district is approximately 54,000 tons of sugar as the season's output.

Johnstone River.

The crop in the Johnstone areas, while very large and probably a record owing to favourable weather and the planting up of new areas, will not in the Director's opinion reach the very high figures of early anticipations. For instance, at South Johnstone estimates were framed reaching the probable enormous yield of 293,000 tons of cane for the South Johnstone Mill. The present estimate of the mill authorities is 200,000 tons of cane which may be harvested under favourable conditions. This mill is doing splendid work this season, the labour difficulties of last year having been overcome, and an extra shift is now worked on Sundays. Crushing per day often exceeds 1,000 tons of cane. Due to continued rains in this district the present commercial sugar in the cane is on the low side, which may also affect the estimate. Further, a great deal of the cane has arrowed this year so that no further growth is expected. In addition to this also some crops are cutting out lighter than was anticipated. The cane looks healthy and vigorous, however, and scarcely any disease was visible at present. The whole of this immense area is fine sugar-producing country, and droughts are unknown. The rainfall to date has been some 110 inches. Some of the cane supplied to the South Johnstone Mill is sent in with too much trash roots and tops. Trucks sampled before and after cleaning the cane showed great differences, and the improvement in monetary value after cleaning varied from 8s. 3d. to 13s. 4d. per ton. The foregoing may indicate why to some extent South Johnstone has failed to secure as high a sugar content as other mills in this district. Grubs were doing a little damage also the borer weevil. The liberation of the parasitic Tachinid fly by the Entomological Division of the Bureau of Sugar Experiment Stations is keeping the borer in check.

Goondi.

The Goondi Mill was found to be doing fine work, also Mourilyan which started later than the other mills in this district. The Tully River lands are being planted with cane and the new mill is now well under way. Should all go well it is possible that a small crushing may be made towards the end of 1925. This land is the subject of inquiry from all over Australia.

Babinda.

At Babinda conditions were very wet also. Up to date some 142 inches have fallen since the beginning of the year. The commercial cane sugar in the cane is at present on the low side. At the time of the Director's visit it was only 10 per cent. This year the mill expects to deal with 200,000 tons of cane if all conditions remain favourable, the total crushed last year being 165,000 tons of cane. It is remarkable how tonnages have increased in the North. Not so long ago 70,000 to 80,000 tons of cane were considered a fine crushing. Now such a crop would be considered very small by the Innisfail and Cairns Mills. Grubs were doing very little damage this year, and the cane looked very well. The Babinda Mill which was recently transferred by the Government to the farmers, was working well and smoothly. Improvements in the extraction and recovery have been made by certain alterations in the machinery.

Mulgrave.

Considerable improvements have been effected at the Mulgrave Mill which was found to be doing very fine work. A new 14-ton vacuum pan has been installed as well as a suction gas plant of 47 h.p. for use in the off season. A further 22 miles of portable tram track have been purchased, and 3½ miles of 40-lb. rails have been



PLATE 36.—FIELD DAY AT MACKAY SUGAR EXPERIMENT STATION, 6TH JUNE, 1924.
THE DIRECTOR (MR. H. T. EASTERBY) ADDRESSING FARMERS.



PLATE 37.—FIELD DAY AT MACKAY SUGAR EXPERIMENT STATION, 6TH JUNE, 1924.

added to the permanent way. Two new Hudswell-Clarke locos. have arrived for the mill, together with an additional 150 cane trucks. The old fitting shop has been considerably extended and an additional electric pump (making four in all) has been installed providing for 250,000 gallons of water per hour. A large concrete reservoir with roof is being provided to store 275,000 gallons of molasses. Part of the molasses output is sold to the Federal Government for their factory at Brisbane.

The Mulgrave Mill has also found it necessary to reduce their original estimate for this year. The large area of arrowed cane and the fact that 2,000 acres of cane were cut very late last season are given as the reason for this. Very little damage has been experienced here from grubs this year. At Hambledon also, where grubs have been prevalent in recent years, little or no damage was being done this year. This mill has also made many improvements latterly, and has a very large crop to deal with this season.

Mossman.

The Mossman district was also looking particularly well this year. The cane crops are good, little or no disease or grub damage was apparent. The mill which expects to crush 75,000 tons of cane this season, will commence operations in about a week's time. A new Babcock boiler has been put in and a further chimney stack is now being erected. A weir pump has also been added. The directors have decided to purchase a new crushing mill for next year, the rollers to be 72 by 34 inches. This mill will be placed in front of the other two existing mills. The cultivation in this district has considerably improved during the last few years, and perhaps more fertiliser is used in this district than in any other. There are at present 4,800 acres under cane. Preliminary trials showed an average of 11.6 per cent. of commercial cane sugar in the cane. Some excellent cane varieties were inspected at Messrs. Crees Brothers' farm, including H.Q.458 and E.K.28. A fine third ratoon crop of Q.813 was seen at Mr. J. Pringle's farm. The entire district is very prosperous.

Lower Burdekin.

At the Lower Burdekin district a fine crop is being harvested. Grubs are still causing trouble in parts of the district, although they have not been seen to any extent in the Haughton this year. This district being very much drier than the Northern cane areas is showing much higher commercial cane sugar. Many growers are obtaining averages of 15 and 16 per cent. already. The variety plot on Mr. G. Mackersie's farm was visited, and E.K.1, E.K.28, Q.813, Q.903, and the Tableland canes were found to be doing very well. The irrigation experiments with cane at the Home Hill State Farm were also visited, and new experiments laid down for the coming year. At the Inkerman Mill a very fine electric power-house has been built. The new machinery includes a suction gas plant of 240 h.p., with Bellis-Morecomb engines, which are used in connection with electric driver throughout the mill. A new multitubular boiler has been erected. The mill expects a big crushing, and was putting cane through at the rate of 5,600 tons per week. Kalamia Mill was doing excellent work also, and a number of additions and improvements have been installed, the proprietors spending about £30,000 last year in increasing the efficiency of the mill.

On the Lower Burdekin areas quite a lot of B.208 is now being grown, Badila, unfortunately, having developed a good deal of top rot. Large areas of land have been recently planted and the young cane has struck remarkably well.

Successful Field Days.

Highly successful field days were held at Bundaberg, Mackay, and South Johnstone Experiment Stations during the Director's tour. It is estimated that over 500 farmers attended the Bundaberg and Mackay field days, showing that these functions are becoming increasingly popular. Machinery demonstrations were given, in addition to particulars as to cane cultivation, and farmers generally displayed the keenest interest in the proceedings.

Summary.

During his visit to the cane areas of North Queensland—i.e., above Townsville—constant showery weather with warm temperatures was experienced. Contrasted with the cold dry heavy atmosphere of last year the change was very marked. At this time last year the sugar in the cane was very high. This year it is so far low in these

districts. This with the arrowing of the cane should have a steadying effect on the anticipated surplus which the Director does not now consider will be as large as originally expected. A preliminary revised approximate estimate will be issued in a few days. The most striking factor in North Queensland has been the increase in the capacity of the various mills during the recent agreements between the State and Federal Governments. It is estimated that quite £500,000 have been spent by existing mills in remodelling and additions to their sugar machinery. The growers also have not been behind, and some hundreds of tractors are now being used as well as improved farm machinery and fertilisers.

CANE PEST COMBAT AND CONTROL.

The Director of the Bureau of Sugar Experiment Stations has received the following report (11th July, 1924) from the Entomologist at Meringa, Mr. E. Jarvis:—

Liberation of Tachinid Flies.

Mention was made in my last monthly report of a big emergence of tachinid flies at our Laboratory early in May, one hundred of which were forwarded to the Herbert River district for liberation among borer-infested cane.

These flies carried well in glass tubes, measuring 9 inches by 1½ inches, closed with a moist wad of cotton wool; food being provided during the journey in the shape of small wafers of freshly cut sugar-cane. They were liberated by Mr. G. Bates about 1½ mile below Macknade Mill in a block of standover Clark's Seedling.

Vegetable Parasite of Tachinid Flies.

Towards the end of May the entomogenous fungus (*Empusa* sp.) appeared in a large breeding-cage which contained about 300 specimens of *Ceromasia sphonophori*. Several dead flies were seen on the 21st instant adhering to mosquito-netting, leaves, &c., which, upon removal to a damp chamber, quickly developed a luxuriant growth of the conidiophores so characteristic of this interesting genus.

The spores or conidia, which are ejected in countless numbers from the threads that bear them, are able, when coming into contact with healthy flies during favourable atmospheric conditions, to germinate and ultimately destroy them in a few hours.

Cane Grubs of the Herbert River District.

Wishing to ascertain which species of our Scarabæidæ are destructive to cane roots around Macknade, ploughs were followed on various selections, but, unfortunately, the grubs brought to the surface in this way proved to be those of the common grey-back (*Lepidoderma albohirtum* Waterh.), the "Christmas beetle" (*Anoplognathus boisduvali* Boisd.), *Lepidiota rothei* Blackb., and *Dasygnathus australis-dejeani* Mackl., all of which occur more or less plentifully in canefields of the Cairns district.

I was hoping to have come upon grubs of the so-called "Green beetle" of the Herbert River farmers, imagines of which are often collected during the flighting season and paid for at the rate of about 2s. per quart. This species is believed by some to be *Anoplognathus mastersi* Mackl., a lovely metallic greenish-gold beetle about three quarters on an inch long. It is said to feed on the leaves of *Commersonia echinata*, and on bamboo.

Possibly, however, the grubs of either *A. punctulatum* Oliff. or *smaragdinus* Ohaus., both of which species are bright green, may be injurious to cane, the latter beetle having, indeed, been found commonly eating the foliage of *Hibiscus tiliaceus* growing freely along the banks of the river.

I am inclined to think *smaragdinus*, which is of a brilliant green colour, will ultimately prove to be the species in question, as *mastersi* is uniformly golden, the greenish flush not being sufficiently marked to attract attention at first sight.

The term "Golden beetle," used on the Burdekin for one of their cane-beetles, is evidently applied there to the species which we call "Christmas beetle" in the Cairns district, viz., *Anoplognathus boisduvali* Boisd.

From data now obtained it may be gathered that *albohirtum* (grey-back) does most of the damage to cane on the Herbert; *boisduvali* coming second in economic importance, then *australis-dejeani*.

The occurrence of grubs of the last-mentioned species on seven different selections near Macknade is somewhat surprising, since this beetle, like other related dynastids, is known to subsist principally on vegetables, debris, humus, &c. In the Cairns district it is a minor cane pest, while *boisduvali* comes about third in importance, and *Lepidiota frenchi* Blackb. second.

Experiments with Calcium Cyanide (continued).

Following on our first experimentation last February with this insecticide—accounts of which were published in previous monthly reports (*see* “Australian Sugar Journal,” Vol. XV., p. 708, and XVI., p. 66)—investigation of the possibilities of this form of cyanide as a controlling factor against cane grubs has been continued at our Laboratory. It may be mentioned here that calcium cyanide, when acted upon by watery vapour in the air, produces hydrocyanic acid and ordinary slaked lime, the former well-known product being an exceedingly deadly fumigant. Since reporting last, I have received samples of the nodular and flaked forms of this insecticide, the latter of which being cleaner to handle and taking longer to evaporate than other forms, appears to be the most suitable for our purpose.

During last April, thirty-six cages of moist soil, each containing a single third-stage larva of *albohirtum*, were treated with from 8 to 12 grains per cage of flaked calcium cyanide, placed about 3 inches above the grubs. When examined twenty-four hours later all specimens were found to be quite dead, and a strong odour of cyanide still pervaded the soil.

A dose of 10 grains applied 1 foot apart on both sides of the cane rows works out at about 30 lb. of the insecticide per acre, and if found effective in field practice it would be cheaper than either para-dichlor. or carbon bisulphide.

Preliminary tests were applied during May to determine the effect of calcium cyanide on growing cane roots. Up to the present the outlook in this connection certainly looks promising.

Three cane stools about 1 foot high growing in the open were injected on each side with 20-grain doses of the flaked form, placed 6 inches from stools and 3 inches deep. This double dose (at rate of 60 lb. per acre) had no effect whatever, either on the leaves or growth of these plants.

Later, in a field experiment carried out on 16th June, four young plants of Badila from 9 to 12 inches high were treated with 40-grain doses (20 grains on each side), 6 inches from plants, and sprinkled in the soil at a depth of 6 inches, each dose occupying a space of about 8 square inches. The next four plants in the same row of cane were left as controls; while the four plants adjoining this check received similar treatment to the first four, but were given 60-grain doses per plant. When examined forty-eight hours later, both the growth and appearance of treated and check plants had remained perfectly normal throughout the experiment, and no odour of cyanide could be detected in the soil around injections. When looked at eight days after treatment all plants in the row had made equal growth.

Success of Para-dichlor. as a Grub Fumigant.

The various experiment plots treated with para-dichlor. this season have again yielded interesting data. Although grubs have not been very plentiful anywhere, some of these plots were laid out in grub-infested canefields. On such areas the stools on blocks treated last January with this fumigant have remained standing erect and perfectly green, in marked contrast to cane on adjoining check plots, which commenced to go yellow about two months ago, and in some cases has fallen over. Much of this grub-eaten cane would have died altogether, had not intermittent showers and cloudy days enabled it to produce a few fresh heartleaves and roots.

On plots of Badila, D.1135, and Clark's Seedling, free from grub attack, which were injected with varying doses of para-dichlor. (1/16th to ¼ oz.) testing its action on the growth of young ratoon and plant cane, the result in all cases has demonstrated that this fumigant does not in any way injure the plants; there being no difference whatever in height or colour between rows of treated and check stools.

The above results, obtained in more or less striking degree during this season and last year, wherever grubs have been present, afford conclusive proof of the insecticidal value of para-dichlor. as a remedy for this cane pest.

When, as was the case last April, stools that had been injected with ¼-oz. doses three months earlier were plainly seen from a distance of a quarter of a mile standing out as a dark-green strip amongst a patch of yellow grub-eaten cane, one is forced to believe the fumigant used to be the controlling agent.

THE FEEDING VALUE OF MAIZE GRAIN.*

ITS UTILISATION WHEN CHEAP.

By H. WENHOLZ, B.Ag.Sc.

Maize ranks high amongst grains in value for feeding purposes, firstly, because of its large percentage of digestible nutrients, secondly, because of its high palatability, and, thirdly, at the present time because of its comparative cheapness.

The prospect of the present Australian crop, which has largely been already harvested, is such that it is the largest which has been in sight for many years, and with the country generally facing better conditions than for some time, and the consequent falling off in the demand for maize on this account, the price of maize has dropped to about 4s. per bushel, which is about the lowest level it has reached for many years. Many farmers are, therefore, finding themselves in such a position that the present market price offers little margin above the cost of production.

In this article an attempt will be made to show farmers how better prices may be realised for their crop in years such as this, when there is a surplus production.

The grain of maize contains roughly 70 per cent. carbohydrates matter, 10 per cent. protein, and 5 per cent. fat. The high percentage of carbohydrates and fat explain the heat-forming and warmth-producing nature of the food, and its high percentage of digestible nutrients, 95 per cent. of carbohydrates, 76 per cent. of protein, and 85 per cent. of fat make it a very economical food for stock.

The United States of America produces annually about 3,000,000,000 bushels of maize from 100,000,000 acres, and of this huge crop more than 80 per cent. is utilised for feeding to stock largely on the farm, where it is grown, which usually represents a more profitable method of marketing, "making the maize walk to market on four legs."

Maize as Feed for Pigs.

Of the enormous American crop about 40 per cent. is consumed by pigs, for which animals maize is particularly good in view of their limited digestive capacity and the consequent inability to consume a large quantity of bulky, fibrous food.

It is for the final fattening or topping up of pigs that maize is so valuable. Store pigs put on weight rapidly when maize is fed to them, and the prime quality of porkers or baconers "corn fed" is well known.

For growing pigs maize requires further supplementing with proteins or muscle-forming constituents and ash or bone forming materials in which it is largely deficient.

Being a heating and fat producing food, maize should be used very sparingly to brood sows before farrowing, but after farrowing and during the suckling of the young pigs, maize can be used with advantage if supplemented with other foods to supply protein and with materials for bone production.

The Australian farmer usually appreciates the value of maize for pig feeding, and is little if any behind his American cousin in this respect, and many are fortunate this season in having made provision for turning cheap maize into rather good-priced pork and bacon. For those unfortunate farmers who are not sufficiently foreseeing, store pigs are probably now mostly too dear to buy, and this use of cheap maize is denied them. But another time it is advised to look well ahead for these periods of plentiful maize and arrange for them by having many pigs on hand.

Utilising Maize as Feed for Dairy Cows.

By far the greatest remaining portion of the American crop is fed to dairy cows, but strangely maize has been scarcely yet recognised as a valuable feed by the dairy farmers of Australia. Yet those few who have become acquainted with its high value for this purpose were found to be feeding it when maize was 10s. per bushel a few years ago, rather than dispose of it direct on the grain market. This is sufficient tribute to its value.

It must be remembered that maize is largely a carbonaceous food, and that it lacks the protein and also the mineral matter necessary for milk production. The maize, therefore, requires to be supplemented with other concentrates, such as bran or oil

* In "Australian Farming" for July.

cake. For average cows about 2 lb. of ground or cracked maize, together with 2 lb. bran or linseed meal, added to the ordinary ration of silage and lucerne hay gives excellent results, and these qualities can be further increased with profit for the better producing individuals of the herd.

For beef-cattle at present low prices, the feeding of maize grain may not be desirable, but experience has yet to be gained in the utilisation of maize as a topping feed to get quick results and good quality just prior to marketing as "fats." Feeding whole grain to cattle is somewhat wasteful, unless they are followed up by pigs to consume the large quantity voided in the manure.

Maize as Feed for Sheep.

The feeding of maize to sheep in times of drought is a well-known and largely practised method of utilisation of maize grain in Australia, which probably leads the world in recognising its high value in this respect. A few ounces of maize per sheep per day, supplemented by rough feed, even such as lopped scrub in the Western country, has been the salvation of many a flock of sheep during drought periods.

It is an anomaly, however, that maize should only be recognised as a good feed during such times of stress, and that no attention should be paid to it by the grazier as a supplementary feed in normal times when maize can be bought cheaply. The finishing of lambs and mutton on cheap maize at the present good prices of this class of meat should at least commend itself to many. For breeding ewes, maize should be withheld from the ration owing to its constipative effect, and also because it tends to lay on internal fat, but after lambing maize is ideal in promoting a good flow of milk for the young lambs. It is certain that far more thrifty, healthy, and quick growing lambs are raised if the milk supply of the ewes can be well maintained, and maize certainly assists considerably in this.

Maize as Feed for Horses.

Maize is one of the best feeds for horses, and is generally well utilised on them on most farms where maize is grown. Because of its high warmth-producing qualities maize is superior to other grains for horse feeding during the winter months. Being highly digestible, it provides a large amount of energy for horses doing long hours of arduous work. It is also particularly palatable, and with its starches readily convertible into sugars is an easy assimilable food.

Provided maize is balanced with some feed supplying protein, such as lucerne hay, it may form a large part of the grain fed to horses. It is best cracked for horses, as it is not desirable to expend a large amount of the horse's energy in the preparation of its food.

When maize is cheap and there is a tendency to use large amounts in the horse feed on the farm, and particularly in the coastal districts where little hay is grown, it will be an advantage to lighten the mass of grain in the horse's stomach. The husk of oats serves this purpose well when oats is the grain feed, and wheat bran is probably one of the best mixtures with maize to serve this end. The grinding of the whole cob of maize may also be done with good effect under these conditions.

Utilising Cheap Maize for Poultry Feed.

The utilisation of maize by suburban poultrymen is fairly general during most periods of the year, but mostly and rightly so during the winter months. Maize is very palatable to poultry, and many farmers have observed a sudden increase in their egg production when the new season's maize comes in on the farm.

The farm poultry flock is not usually a well-tended concern, and there is little doubt that in these years of cheap maize the farmer could very well give them more attention. The keeping of poultry in larger numbers and their systematic feeding for meat production will possibly indirectly double or treble the price received for cheap maize on the market, especially when the saving on the family bill for meat (for which cash is often outlayed) is considered.

Conclusion.

It is no use the farmer complaining of a poor price for maize when he has mostly the remedy in his own hands for securing indirectly a better price for his product. By a little foresight in increasing the number of some kinds of stock on the farm in seasons of low-priced maize, and the more general utilisation of this maize to the usual stock on the farm, it is likely that the large crop can be consumed at the rate of several bushels daily, and a far more satisfactory price secured for its indirect sale in this way.

ABSTRACTS AND REVIEWS.

All foreign agricultural intelligence in this section, unless otherwise stated, has been taken from "The International Review of the Science and Practice of Agriculture" and the "International Review of Agricultural Economics," published at Rome by the International Institute of Agriculture.

The Co-operative Cotton Marketing Movement.

"International Cotton Bulletin," Nos. 5, 6, Manchester, September, December, 1923. "Statist," Vol. CII., No. 2,387, London, 24th November, 1923. "Manchester Guardian Commercial," Vol. VII., No. 20, Manchester, 15th November, 1923. "Oklahoma Cotton Grower," Vol. III., Nos. 21, 22, Oklahoma City, 10th and 25th November, 1923. "California Cultivator," Vol. LXI., No. 22, Los Angeles, 1st December, 1923.

The cotton growers' co-operative movement in the United States has been called into being as a result of the very low prices which farmers received for their raw cotton. Owing to the farmers' lack of knowledge, both regarding the quality and grade of the cotton which they had grown and regarding prices and general market conditions, and to the fact that competition between buyers of cotton did not establish correct values, the farmers were at a great disadvantage in the marketing of their crop. Farmers, moreover, were forced to sell their cotton immediately after harvest in order to meet their liabilities, for only 12 per cent. of the farmers in the cotton and tobacco districts of the United States are able to finance their own crop-raising. Thus, though the world-consumption of American cotton is nearly constant from month to month, varying only from 7.9 per cent. in the month of November to 8.9 per cent. in the month of March, yet 70 per cent. of the American cotton crop was sold by farmers during the four months September-December. An investigation by Government officials showed that, as a result of the selling methods practised, "the prices of cotton of the same grade and staple vary as much as 10 dollars and more per bale, and, still more important, the better grades and longer staples are bought at from 35 dollars to 50 dollars below their market values."

Under such conditions the cotton growers' co-operative movement was initiated between two and three years ago. The Department of Agriculture has taken great interest in promoting the organisation of the co-operative societies on a sound basis. It was first necessary, however, for legislation to be obtained enabling the farmers to combine. The passing of the Warehouse Act, the revival of the War Finance Corporation and the direction of its attention to the assistance of agriculture, and the passing of the Capper-Volstead Act, exempting agricultural organisations from complying with the provisions of the Sherman Anti-Trust Law, have been very important factors in making the co-operative movement possible on a large scale. The War Finance Corporation, for example, has approved the application of the South Carolina Cotton Growers' Co-operative Association for an advance of not exceeding 5,000,000 dollars to finance the orderly marketing of cotton during the 1923-1924 season. Over 20 per cent. of the cotton grown in the United States is marketed by farmers' co-operative associations.

Farmers who become members of one of the co-operative associations sign a legal contract under which they agree to deliver all their cotton for sale through the association for a period of five or seven years. The societies have no capital to begin with, but the banks make advances to them on the cotton which they hold.* On delivery of his cotton to the society a farmer receives an advance from the society equal to 60 per cent. of the value of the cotton; the society retains from 1 to 3 per cent. of the gross value for the formation of a reserve fund. The cotton is pooled, and when the whole of the pool has been sold the farmer receives the balance of the full payment due to him. A grower who owns any cotton, even a single bale of a superior quality, is paid an adequate price for it. Under the internal pooling system of the associations each member receives the same price for the same quality and grade of cotton regardless of the time of delivery or sale.

The societies are not allowed to hold cotton back in order to obtain higher prices, but must sell some each month no matter what the price may be. By this means

* The Federal Intermediate Credit Banks, established under the Agricultural Credits Act, 1923, are now also making loans to co-operate cotton marketing associations on the security of warehouse receipts.

a more or less average price over the whole year is obtained, and it is anticipated that this practice will lead to the stabilisation of prices. The amount of cotton to be sold each month is not fixed.

Societies may offer for sale only that cotton which they have actually in their warehouses. They may not go into the market to fill an order but must sell on samples which they hold.

Under the co-operative marketing plan country-damaged cotton is practically non-existent owing to the fact that the banks will not make an advance to a society unless its cotton is immediately brought into a first-class warehouse. The societies do not possess their own warehouses but use any public warehouse of good construction.

The organisation built up by the associations for obtaining large amounts of cotton is complete, but it is required to build up further the organisation for the disposal of the cotton. There are twelve State-wide cotton growers' co-operative associations in the American cotton belt, and although they have been working for only two complete years they have a combined membership of 225,613 farmers. In 1921-1922 the associations sold 354,000 bales of cotton; in 1922-1923 they sold 800,000 bales, whilst for 1923-1924 it is hoped that the amount sold by the associations will be not less than 1,500,000 bales.

These twelve associations comprise the States of North Carolina, South Carolina, Georgia, Mississippi, Alabama, Tennessee, Oklahoma, Arkansas, Texas, Louisiana, Arizona, and Missouri. Their progress is continuing. During the past season their new members numbered 81,973; of this number 24,318 were in Georgia, 15,495 in Oklahoma, and 10,094 in Texas. The Oklahoma Association, with a membership of 50,362 has the largest number of members. All of the associations have received a great deal more cotton this season than last. The Texas Association, for example, which in 1922 received 78,000 bales had up to 20th October, 1923, already received 121,000 bales, and the South Carolina Association was expecting to increase by 25 per cent. its total for the previous year of 40,000 bales.

The twelve State associations are federated in the American Cotton Growers' Exchange, which is their central selling organisation, having its selling offices in Atlanta, Georgia, and its administration offices in Dallas, Texas.

The Laws of Heredity and the Breeding of Farm Animals.

HUNT, W. D., "New Zealand Journal of Agriculture," Vol. XXVII., No. 2.

The author draws attention to the importance of the stock breeder possessing marked ability in the selection of animals, as well as a knowledge of the laws of heredity.

The following is a brief record of results obtained by J. Gibson the well-known Tasmanian breeder of Merino sheep which are grown almost entirely for wool, the desire being to produce a sheep that would give the greatest amount of the best quality of wool. In 1868, he bred the ram "Sir Thomas" the most noted Merino of his time; the heaviest fleece cut from this ram for twelve months' growth was 12 lb. The descendants of "Sir Thomas" given in order gave fleeces of the following weights respectively:—14 lb., 17 lb., 18 lb., 20 lb., 26 lb., 23 lb., 27 lb., 30 lb., 36½ lb.

Thus, in a little over thirty years by selecting those variations showing increased weight of wool, the weight was increased from 12 lb. to 36½ lb., and this was done entirely within the flock without bringing in any outside blood.

The discoveries of Mendel serve to explain the reason for many results, as for example, the fact that red calves sometimes appear in pure herds of black Aberdeen-Angus cattle. Black and red are Mendelian characters and black is dominant and red recessive, hence the result of crossing a black animal with a red would be a black animal although such a calf would carry in its germ-cells the factor for red. From the above it will be seen that, before a red calf can appear in a black herd, both sire and dam must carry the factor for red; further, that if one animal were introduced into a herd which although itself black, carried the factor for red, it would be possible in time for red animals to appear. The only way to make sure of keeping red out of a black herd is as follows:—

(a) Before introducing a new bull into a herd, test it with red or red-and-white cows. If the bull is a pure black, all the calves will be black; if it carries the factor for red about half the calves will be red.

(b) Note results from bulls bred in the herd when used in cross-bred herds. If any calves are red, the bull carries the red factor. If the sire of the bull has been proved pure the red factor must have come from his dam, and the dam should be removed from the herd.

(c) If a red calf is born in a pure black herd the sire and dam must both carry the red factor, and both should be removed from the herd.

Every breeder will be trying constantly to bring his flock or herd nearer to his ideal. In order to do this he can use sires of type and ancestry as near to his ideal as he can get them, or he can select with a view to correcting some weakness in his own animals—that is, if his animals have gone to an extreme in one direction he can try to correct this by using sires that go to an extreme in the other direction.

The author considers that the first method is the best, as although the second method may produce animals of satisfactory appearance, they will not breed true.

To breed true the animals must have uniform germ-cells all carrying the same inheritance-factors. With an outcross there is always the danger of introducing germ-cells carrying the factor for some fault that may prove afterwards very difficult to eliminate, but experience has shown that animals which have been closely inbred for some time, respond quickly to an outcross.

The above consideration brings up the question whether the best plan in a large stud is not to divide the stud into several families and to closely inbreed each within itself until weakness appears; then introduce a sire from one of the other inbred families, and continue the inbreeding until another outcross is required, when another family can be used.

Another important matter when establishing a stud is that of location. Animals can be altered by environment and changes should all be in the direction of strengthening the type for the class of country in which they will live, or to which they will have to adapt themselves if sold. The location should be one where the conditions are such that natural selection will eliminate any individual unable to thrive under the conditions of the sires bred in the stud, where they are likely to be placed when sold.

Milk for Young Chicks.

DELMAS, F., "La Vie Agricole et Rurale," Vol. XXIII, No. 30, pp. 66-69.
Paris, 1923.

With the object of ascertaining whether giving milk to young chicks would prevent the great losses that frequently occur in very young broods, especially when they belong to the Mediterranean breeds, the author made experiments with forty-two Leghorn chickens (of the white and brown varieties) that had been hatched on the same day. The chickens were divided into two lots each of twenty-one birds. The first lot was given milk with the addition of one-third water and weighed 987 gms., while the second had only water to drink and weighed 994 gms. Both lots were otherwise fed exactly alike. The chicks drank the milk-and-water with avidity. The experiment was continued for two months, and the results obtained were indisputable; in the first lot, only two chickens died, whereas the number of deaths in the second was six.

These results were confirmed by experiments conducted on vitamines, and if vitamines A (antirachitis) is deficient in the food ration of chicks it should be introduced into the average ration, even if the ration contains sufficient vitamin B (antineuritic) from the liberal grain supply, and also plenty of vitamines C (antiscorbutic) which can be obtained from green food.

MAIZE ON THE DOWNS.

Some good maize yields are reported from the Downs. In the Yangan district there was harvested a crop of 250 bags from a measured paddock of 10 acres $7\frac{1}{2}$ square chains, which works out at $23\frac{1}{2}$ bags per acre. This was grown by Mr W. R. Canning, on what was not generally looked upon as very good land, but which, undoubtedly, has benefited from the spell it has had. Some excellent samples of yellow maize have been shown by Mr. A. A. D. Clarson from his farm at Yangan. The samples were excellent types of Star Leaming yellow maize, the cobs being not only very large, but uniform and compact. One of the samples measures $11\frac{1}{2}$ in. in length, $8\frac{1}{2}$ in. at the butt, 6 in. at the other end, and weighed 1 lb. 8 oz. The number of rows of grain was twenty-four. The second sample was $8\frac{1}{2}$ in. long, $8\frac{1}{2}$ in. at the butt, and $6\frac{3}{4}$ in. at the end, containing twenty-two rows. The seed was purchased from the Department of Agriculture, and was planted during the second week of December. Mr. Clarson has 6 acres of this particular variety, and has also another good yield of Funk's Yellow Dent variety, the seed of which was also obtained from the same source.

THE DENTITION OF THE PIG.

HOW TO TELL THE CORRECT AGE.

E. J. SHELTON, H.D.A., Instructor in Pig Raising.

It is unfortunate that sometimes the pig farmer, or rather the breeder of stud pigs who exhibits his pigs at our leading Agricultural Shows, is eyed with considerable suspicion by his fellow breeders when he offers for exhibition and sale certain pigs (they might be active, vigorous males or comely, polished females) which to the average ringsider are apparently "well over the age" stipulated in the show schedules or sale catalogues for the particular class in which the pigs are entered.

The writer has on several occasions when judging at the larger shows had occasion to disqualify a number of pigs for this reason, much, of course, to the annoyance of the exhibitor concerned, but also frequently to the entire satisfaction of those who are honestly trying to build up a herd on correct lines, and to run straight, to play the game, and to follow the adage, "Honesty is the best policy."

Only quite recently in discussing the matter with a prominent exhibitor at a Southern show, the following remarks were passed. The question the writer asked was on these lines: "Now, Mr. ———, to be perfectly fair and square, or as our Queensland boys will have it, to be 'Dinki Di,' aren't you sure these pigs are over age?" This put the exhibitor right up against the wall, as a reasonably attractive figure was offering for the pigs under review, if everything was "O.K." "Oh, well, Mr. Shelton," said the exhibitor: "It's this way. You can see for yourself what's going on all around these pens, and if I want to win I've got to do the same as the other fellow is doing."

Now these remarks are not intended to cast aspersion on any particular exhibitor or group of exhibitors, or even to suggest that malpractices are being followed—they are merely introductory and to call attention to the necessity of some better system being put into operation; though even by a most careful study of a dentition chart and a deliberate attempt to follow this out to the letter, it will not always be possible to arrive at an absolute certainty as to age, for the class and condition of the feed used and the environment generally, doubtless, will have their effect on the pigs' teeth just the same as happens in the case of horses, cattle, and sheep.

The Council of the Royal Agricultural Society of New South Wales some two or three years ago, in attempting to overcome what was apparently an attempt at unfair competition on the part of some exhibitors of stud pigs, followed the lead set by several British Societies, and inserted in their Stud Pig Schedules the following regulations.

"Should any question arise as to the age of any exhibit in the pig classes, the stewards shall, at the request of the judge, have the state of their dentition examined by a competent authority. If the state of dentition shall indicate that the age of any pig does not agree with the dentition test, the stewards shall report the same to the Council, who shall have power to disqualify such pig or pigs.

The following is the state of dentition in pigs which will be considered as indicating that they exceed the ages specified below:—

Six Months.—Pigs having their corner permanent incisors cut, will be considered as exceeding this age.

Nine Months.—Pigs having their permanent tusks more than half up, will be considered as exceeding this age.

Twelve Months.—Pigs having their central permanent incisors up and any of the three first permanent molars cut, will be considered as exceeding this age.

Fifteen Months.—Pigs having their lateral temporary incisors shed and the permanents appearing, will be considered as exceeding this age.

Eighteen Months.—Pigs having their lateral permanent incisors fully up, will be considered as exceeding this age.

From the above and from a study of the accompanying illustrations it will be observed that there are several groups of teeth in the pig's mouth, though it is by no means an easy task to make a careful examination of same. In his very precise description of these teeth, Sir G. T. Browne, in his manual on "The Pig," has the following to say:—When dentition is perfect the pig has six incisor teeth in the front of both upper and lower jaws—two central, two lateral, and two corner teeth. Behind the corner teeth are the tusks, one on each side in the upper and lower jaws. Between the tusks and the molar teeth there are usually four small teeth which are described as pre-molars, one on each side of both jaws; and twenty-four molars, six on each side of the upper and lower jaws.

Temporary and permanent incisors agree generally in number, form, and position, but the temporary molars are only three in number on each side of the upper and lower jaws, and the third molar has three cusps instead of two. The temporary tusks are much smaller and more pointed than the permanent teeth which replace them, and the pre-molars are not represented by temporary teeth, but are permanent from the first. It may be observed that no difficulty is found by the experts in distinguishing the permanent incisors from the temporary organs, especially when both orders are in the mouth together. This distinction is not, however, so marked as to secure the tyro from risk of error.

At birth (Fig. 1) the pig has two sharp-pointed teeth laterally placed in each jaw, top and bottom, leaving an open space in the front of the mouth. The teeth much

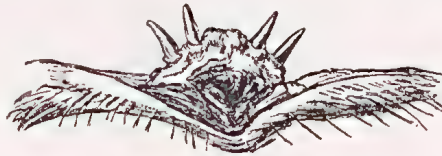
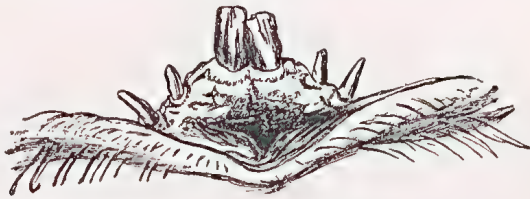


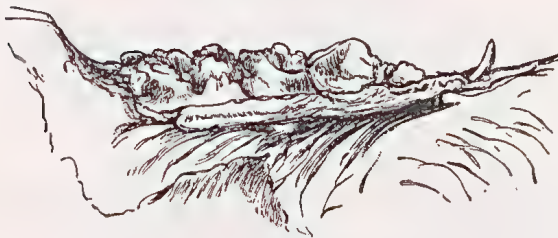
FIG. 1.—TEETH OF PIG AT BIRTH.

resemble small tusks; they are really the temporary tusk and corner incisor. No other teeth are in the mouth at the time of birth; but the temporary molars are immediately under the gum, and in the dried specimen they can be distinctly seen in their relative positions.

At one month old the three temporary molars on each side of the jaw, top and bottom, are cut, the second and third in position being well up, the first one just appearing through the gum; at the same time the two central temporary incisors in each jaw are cut, as shown in the illustration (Fig. 2).



A. INCISORS.



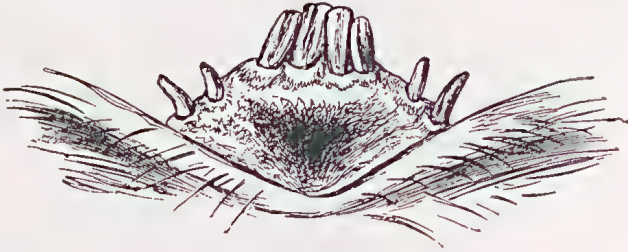
B. MOLARS.

FIG. 2.—INCISORS AND MOLARS OF PIG AT ONE MONTH.

At two months old the temporary central incisors are fully developed, and there are signs of the eruption of the lateral temporary incisors, which generally pierce the gums soon after two months. The first temporary molar is now nearly level with the second.

At three months old the pig has the temporary set of teeth fully developed, the lateral incisors by this time being nearly level with the centrals. The temporary corner teeth and the tusks are further removed from each other than they were at birth, owing to the growth of the jaw. In Fig. 3 the state of the teeth at three months old is indicated.

Excepting the natural growth of the jaws, in common with other parts, no changes occur which will assist the examiner in judging the age of the young pigs until the age of five months is reached. At this time there are evident signs of the cutting of the pre-molars; and the fourth molar, which is the first permanent tooth, is seen behind the temporary teeth.



A. INCISORS.



B. MOLARS.

FIG. 3.—INCISORS AND MOLARS OF PIG AT THREE MONTHS.

The illustration (Fig. 4) shows the state of the molars at the age of six months.

The author then states that, as a large number of pigs are entered at Agricultural Exhibitions at the age of between five and six months, it is necessary to devote particular attention to the signs which are exhibited by the teeth of the pig at this period, and the inspector is particularly required to remember that the animal which he is inspecting may be actually over the stated age at the time of inspection without in consequence being liable to disqualification. This condition of things constantly occurs at the shows which are held after the date up to which the ages are calculated. It is obviously necessary to add the days or weeks which have elapsed to the animal's certified age at the time of making the examination. For example, in cases where ages are calculated to the 1st of June, while the show takes place early in July, a pig which is certified to be five months three weeks and five days old in the class for animals not exceeding six months will be more than a month over the certified age when it is seen by the inspector.

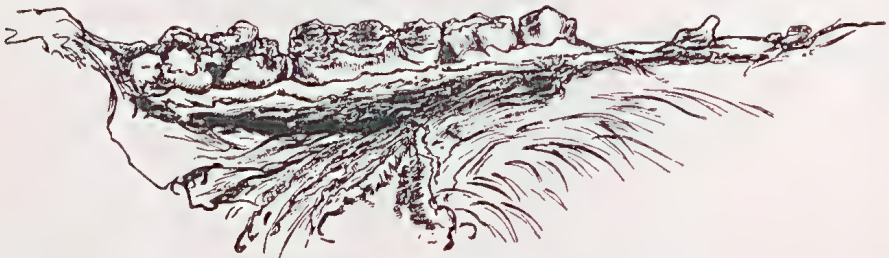


FIG. 4.—MOLARS OF PIG AT SIX MONTHS.

Again, it must be noted that the pre-molars are not always developed, and in the same litters, one or two pigs will be found occasionally in which this tooth is absent. The fourth molar is, however, remarkably regular in its appearance, and may be referred to for the purpose of solving any doubt which may arise in consequence of the absence of the pre-molars.

Disqualification of a pig or pigs entered as not exceeding six months would occur under such circumstances as the following:—

The inspector, it may be supposed, is examining the teeth of a pig which is entered as five months and two days; he adds the weeks which have elapsed since the date up to which the age is calculated, and deals with the animal as having arrived at the age of six months and nine days.

At this period he expects to find the pre-molars and the fourth molar well up, the fourth molar being close to the angle of the jaw and scarcely free from the covering of gum at the extreme posterior part. But if the fourth molar stands out from the angle of the jaw, leaving space behind it, and if he observes in addition that the temporary corners have been changed for permanents, he does not hesitate to assert that the pig is at least a month older than it is certified to be. In some cases the corner permanents are found with their points through the gum at seven months, but in many cases the temporary organs remain till the animal has reached the age of eight months.

Disqualifications in the six months old class are often very numerous (at English Shows), the pigs are shown as close to the age as possible, and the frequent presence of the corner teeth in pigs belonging to certain exhibitors is the cause of the animals being rejected.



FIG. 5.—MOLARS OF PIG AT NINE MONTHS.

At nine months the corner permanent teeth are well up, and the permanent tusks may be through the gum in very forward animals at this age. In looking over the notes of the inspections which have been made for many years past, it is shown that, as a rule, the pig at the age of nine months has one or two of the temporary tusks still in position; in fact, the presence of well-developed permanent tusks in a pig entered as not exceeding nine months would be a fair ground of disqualification. The drawings (Figs. 5 and 6) show the state of the teeth at nine months.



FIG. 6.—TEMPORARY INCISORS AND TUSKS OF PIG AT NINE MONTHS.

A class for pigs not exceeding nine months of age at many shows takes the place of the six months class, and, therefore, includes pigs of various ages from two or three months to over eight months. Disqualification in this class generally affects pigs which are really under nine months, in which the state of the dentition indicates the age to be above that which is stated in the (entry) certificate.

If, for instance, a pig which is entered in this class as five months and two weeks has the corner teeth just cut, or one entered as six months and twenty-one days shows evidence of the changing of the temporary tusks, in these cases no hesitation is felt in disqualifying the animals, although in both cases the animals are below the limit of age in the class in which they are entered.

One year old is the age when, according to received opinions, the central permanent incisors are cut. It is, however, more often seen that the temporary incisors are still in their places in pigs which are just under the age of one year, and although the permanent teeth when cut advance very rapidly, a pig entered as not exceeding one year would be looked upon with much suspicion if the central permanent incisors were found to be cut; and if they were well up and some of the anterior temporary molars had fallen and the permanent teeth were filling their places, the animal would be disqualified.

The fifth molar tooth is always cut between ten and twelve months, and its perfect eruption may be taken as evidence that the pig has reached the age of one year. In the illustration (Fig. 7) the recently cut central incisors are shown—a state of dentition which is seen only in very forward animals at the completion of one year of age.



FIG. 7.—CENTRAL PERMANENT INCISORS AND TUSKS OF PIG AT ONE YEAR (EARLY DENTITION).

Shortly after the completion of one year the three anterior temporary molars fall irregularly, and by the time the animal is fifteen months old the three anterior permanent molars are in the mouth, and may readily be known by their sharp, unworn points and their recent appearance, as shown in the next illustration (Fig. 8). These



FIG. 8.—TEETH OF PIG AT FIFTEEN MONTHS; THE THREE PERMANENT ANTERIOR MOLARS RECENTLY CUT.

teeth are very regular in their development and afford valuable evidence in cases where an opinion cannot be formed from an inspection of the incisors alone.

The next change in the dentition is the final one, and occurs between the age of seventeen and eighteen months. At this period the sixth molar, a permanent tooth, is cut, and in forward animals the lateral temporary incisors are changed for permanent teeth. In many instances the temporary lateral teeth remain up to the age of eighteen months, although they are in such cases quite loose, and very often the permanent teeth are cutting through the gum below or by the side of them; in other instances one lateral is found to be fully up and nearly level with the centrals, while the other is just pushing through the gums. The sixth molar also is fairly well up, but the posterior part of its crown is not quite clear from the gum. These changes

complete the permanent dentition of the pig, and there are no indications of the age afforded by the teeth after this period excepting such as depend on the growth and wear of the organs.

In Fig. 9, the sixth molar is shown as it appears at the completion of the age of eighteen months.



FIG. 9.—MOLARS OF PIG AT EIGHTEEN MONTHS, SIXTH MOLAR WELL UP.

It is very important that the examiner should exercise the greatest care in the inspection of the teeth of pigs which are exhibited in the class above twelve and not exceeding eighteen months old. Animals are entered at various ages from twelve to eighteen months; it is necessary, therefore, in this class to note the condition of the central incisors and the anterior molars as well as that of the lateral incisors and the sixth molar. In Fig. 10 the full development of the lateral permanent incisors is shown. This state of dentition, it may be remarked, is indicative of a year and eight months.

At the age of two years the lateral permanent incisors are quite level with the centrals, and are worn on their edges; the sixth molar now stands quite free from contact with the angle of the jaw, and indications of wear may be observed on the upper surface of the other molars. After the pig has attained the age of two years, an opinion as to the age must be to a great extent speculative. The wear which the teeth undergo, the darkening of their colour, and the growth of the tusks, will afford some evidence which will assist the judgment, but there are no changes which can be referred to as indicative of the exact age of the pig after the lateral incisors and the six molars are fully developed.

In the course of the above remarks on the changes which occur in the teeth of the pig at different ages, certain exceptions to the rule of development have been mentioned. They are not numerous, nor very important in their bearings, and it is a subject of common remark that the exceptions are nearly always in favour of the exhibitor, being in the direction of retarded rather than accelerated development.

It may be useful to say a final word in reference to a common mistake into which exhibitors, or rather their servants, frequently fall—*i.e.*, the error of believing that a little discrepancy between the state of dentition and the certified age of an animal is not of much consequence, so long as the age does not exceed the limit of the class in which the animal is entered. The teeth are inspected with a view to ascertaining if they agree with the statement of the age in the certificate of entry, and not for the purpose of insuring that the animal is within the age to which the class is limited."

In New South Wales and Queensland the Councils of the Royal and Royal National Shows decided in order to avoid as much trouble as possible to require that the age of all pigs entered is to be calculated to the day of judging. This certainly is a great advantage, both from the standpoint of exhibitor, judge, and the general public, but so far no attempt has been made to apply the dentition tests even to pigs that have been disqualified. Still it is felt, seeing that at Southern shows the matter is a very live one, Queensland breeders should have the advantage of all the information available on this important subject. It is one that will be discussed at the Annual

Meeting of the Queensland Branch of the Berkshire and Yorkshire Society to be held at Affleck House on the Show Ground, on 13th August, at 10.30 a.m., as well as at the Annual General Meeting of the Federal Council and of members to be held during the currency of the Melbourne Show in September.



FIG. 10.—INCISORS AND TUSKS OF PIG AT ONE YEAR AND EIGHT MONTHS;
LATERAL PERMANENT INCISORS WELL UP.

EXPORT OF PORK PRODUCTS FROM AMERICA.

The export of pork products from the United States of America has declined rapidly during recent months. In the case of lard, this decrease is due in part to the increased slaughter of pigs in Germany. With the stabilisation of the currency and the imposition of increased taxes German farmers have been marketing pigs much more rapidly than last year, and since the number of pigs in Germany is reported to be 2,750,000 greater than last year there is a possibility of the continuance of a greater domestic supply of pork products; this is likely to have an effect on the export markets.

FRUIT FLY INVESTIGATIONS.

ENTOMOLOGIST'S REPORT.

Report for June, 1924, on Fruit Fly investigations combining April, May, and June, by Mr. Hubert Jarvis, State Entomologist, Stanthorpe district, made available for publication by the Minister for Agriculture and Stock (Hon. W. N. Gillies).

Fruit Fly (*C. tryoni*).

During April the Queensland Fruit Fly (*Chaetodacus tryoni*, Froggatt) was still active, and could be seen on the wing during the warmer hours of the day in sheltered situations. On 8th April, several fruit flies were observed by Inspector J. Henderson and myself, flying around and alighting on passion vine fruit and foliage in the Stanthorpe area, but a trap at once placed on the passion vine failed to catch any flies. On 12th May, Mr. J. O'Halloran (The Summit) observed fruit flies alighting on a heap of pumpkins and melons. He trapped a number of these flies, and submitted them to this office, and they proved (with one exception) to be examples of the Queensland Fruit Fly (*C. tryoni*). This is the latest record of adult fruit fly occurrence in the field in this district.

The following are the Insectary records of maggot pupation and fly emergence during May and June:—

During the above period the maximum soil temperature taken at a depth of 2.3 in. was 60 deg. Fahr., and the minimum 40 deg. Fahr. (Note.—Minimum temperatures were taken at sunrise, and maximum at midday.)

Date of Emergence.	Approximate Date of Pupation.	Number Hatched.	Species.	Host-Fruit.
5th May, 1924 ..	29th April, 1924 ..	24	<i>C. tryoni</i>	Pear
7th May, 1924 ..	22nd April, 1924 ..	4	<i>C. tryoni</i>	Pear
10th May, 1924 ..	7-12th April, 1924	10	<i>C. tryoni</i>	Quince
12th May, 1924 ..	12th April, 1924 ..	15	<i>C. tryoni</i>	Pear
13th May, 1924 ..	12th April, 1924 ..	14	<i>C. tryoni</i>	Pear
14th May, 1924 ..	10th April, 1924 ..	6	<i>C. tryoni</i>	Pear
15th May, 1924 ..	10th April, 1924 ..	19	<i>C. tryoni</i>	Quince
16th May, 1924 ..	10th April, 1924 ..	14	<i>C. tryoni</i>	Pear and quince
17th May, 1924 ..	15th April, 1924 ..	10	<i>C. tryoni</i>	Pear and quince
20th May, 1924 ..	15th April, 1924 ..	3	<i>C. tryoni</i>	Pear and quince
21st May, 1924 ..	12th April, 1924 ..	12	<i>C. tryoni</i>	Pear and quince
23rd May, 1924 ..	15th April, 1924 ..	7	<i>C. tryoni</i>	Quince
26th May, 1924 ..	12th April, 1924 ..	4	<i>C. tryoni</i>	Pear and quince
29th May, 1924 ..	12th April, 1924 ..	2	<i>C. tryoni</i>	Pear and quince
2nd June, 1924 ..	23rd April, 1924 ..	2	<i>C. tryoni</i>	Pear and quince
4th June, 1924 ..	23rd April, 1924 ..	2	<i>C. tryoni</i>	Pear and quince
15th June, 1924 ..	15th April, 1924 ..	2	<i>C. tryoni</i>	Pear and quince

FRUIT FLY—HATCHINGS IN CAGES CONTAINING INFESTED FRUIT IN THE FIELD ARE AS FOLLOW:—

Date of Emergence.	Date Cage was Placed.	Locality.	No. Hatched.
16th May, 1924 ..	10th April, 1924 ..	Applethorpe ..	1
27th May, 1924 ..	17th April, 1924 ..	The Summit ..	5
17th May, 1924 ..	11th April, 1924 ..	Dalveen ..	2
27th May, 1924 ..	10th April, 1924 ..	Applethorpe ..	5
31st May, 1924 ..	11th April, 1924 ..	Dalveen ..	12

No flies were found to have emerged from any cage placed in the field after 31st May. It is, of course, possible that some fruit flies had emerged and had been destroyed by small ants prior to a visit of inspection.

Effect of Cold on Adult Fruit Flies.

On 1st April, 150 fruit flies (*C. tryoni*) were placed in two large cages in the Insectary. These cages were stood in large tin trays, containing soil about 3 in. deep. The top of both cages was of wood, and various fruits were suspended in order to

ascertain if the Queensland Fruit Fly would oviposit in captivity. Both sexes were well represented, the female predominating.

Only 14 of these flies died between 1st April and 23rd May, on which latter date 3 deg. Fahr. of frost was recorded, and 12 flies were found dead; on 26th May, 1924, 14 deg. Fahr. of frost was registered and 30 flies died; on 27th May, 1924, 17 deg. Fahr. of frost was registered and 56 flies succumbed; the remaining flies died between 27th May, 1924, and 15th June, 1924.

It seems reasonable to conclude, from the above experiment, that *C. tryoni* cannot, as an adult fly, long withstand the rigorous cold experienced at Stanthorpe during the winter months; but it is, of course, possible that fruit flies seeking very warm and sheltered situations, such as hollow trees or under thick bark, might survive the winter in such situations.

Although the fruit flies in both cages were observed crawling over the suspended fruits oviposition did not take place; nor were any flies seen to mate. Dead female flies examined soon after death showed no egg development.

Fruit Fly Occurrence on Native Fruit.

On 12th June, Mr. W. Townsend, of Severnlea, brought to this office several berries picked from a native tree which was growing adjacent to his orchard. One of these berries contained a maggot which, on examination, proved to be that of a fruit fly. On 16th June a visit was made to Mr. Townsend's property (in company with the Chief Inspector, Mr. T. W. Lowry) to inspect this native fruit.

The tree which was about 15 ft. in height and covered with berries was growing in a very sheltered situation in the bed of a creek, flanked on either side by high hills. No frost could possibly reach the fruit of this tree, as it was surrounded by tall Eucalyptus trees, affording a canopy of leaves above it. The berries were round and black, and not unlike a very small cherry and with a similar stone to this latter fruit. On examining a number of these berries several maggots were discovered (*in situ*), and proved to be those of a fruit fly (*Chaetodacus* sp.).

Mr. Lowry, after very careful searching under the tree among the humus and sandy soil discovered many fruit flies puparia.

Specimens of both maggots and puparia, and also of the fruit and foliage of the tree were forwarded at once to the Government Entomologist and Plant Pathologist, Mr. H. Tryon, who concurred with the writer in identifying the maggots and puparia as those of a fruit fly, and Mr. C. T. White, Government Botanist, identified the tree as *Notelaea longifolia*, var. *velutina* from the specimens submitted to him by Mr. Tryon.

This discovery of Mr. Townsend's is of some importance, showing as it does that fruit fly maggots are active in a native fruit in the Stanthorpe district as late as 16th June; also, should these maggots and puparia prove to be those of *C. tryoni* (the Queensland Fruit Fly), *Notelaea longifolia*, will be an additional known native host-fruit of this fly.

The tree *Notelaea longifolia* is of a spreading habit, growing along creek-margins and in very sheltered gullies. Mr. Townsend had, at the time of our visit, located two of these trees, and additional specimens of it were found in the vicinity and also in other parts of the district; and it is probable that many of these trees are growing in sheltered gullies both in the Stanthorpe district and in the adjacent country.

Two fly traps were set in the tree on which maggot-infested fruit was found. One trap was baited with "Magnet Lure," and the other with "Harvey's Lure." These traps were inspected on three consecutive days, but no fruit flies were caught nor were any seen on the tree or in its vicinity. A large quantity of puparia and fruit, and also the soil from under the trees was collected and transferred to the Stanthorpe Insectary. No fruit flies have yet hatched from this material.

Fruit Fly Puparia under Cultivated Fruit.

On 8th July, several fruit fly puparia were taken from under maggot-infested fruit (apples) placed nearly two months earlier in the field under a gauze cage. These puparia when lifted from the soil appeared quite normal and healthy, but when examined later in the day in the laboratory they were all found to be dead, and some to contain a creamy liquid in a state of decomposition, and others again were partially dry. The maggots from the above fruit probably pupated towards the middle or end of April, as the fruit was put out on 10th April, and at that time it contained fruit fly maggots in all stages of growth.

* *Lonchea splendida*.

OTHER INJURIOUS INSECTS.

Leaf Hopper.

A small "leaf hopper" (*Fulgorid* sp.) was brought to my notice on 12th May by Inspector Maggs. This insect was occurring on quince and apple trees at The Summit. It was only to be found close to the ground on the barrel or trunk of the tree, and was not apparently doing much damage. The trees were surrounded with long grass, and it appeared probable that when this grass was cleared away the leaf hopper would disappear also.

Orange Bug (?).

On 12th May, 1924, oranges were received from Inspector F. Williams, of Warwick, showing numerous punctures on the surface; these punctures did not extend into the pulp, and in some cases did not even pierce quite through the skin. None of the punctures contained eggs, and they were probably made by some sucking insect, such as the Green or Black Orange Bug. These punctures were remarkably like those of a fruit fly in appearance, and were in fact supposed (by the owner of the fruit) to have been made by this latter insect.

Concluding Remarks.

The weekly inspection of field cages and care of Insectary, &c., has claimed a good deal of time, as has also the preparation of drawings illustrating in colour some of the principal Fruit Flies of the Granite Belt, and the description of same. It is proposed to continue this work in further Bulletins. [The publication of this illustrated Bulletin on Fruit Flies has been officially authorised.—H. Tryon, 21st July, 1924.]

HOW TO SLAUGHTER A PIG AND CURE BACON.

The easiest and probably the best method of slaughtering a pig on the farm is to shoot the animal in the head just above the line of eyes, then hang carcass up head downwards, and make an incision in the throat running the knife (a fairly long blade) upwards along the wind pipe until the forked vein is reached; this should be severed in order that the blood may thoroughly drain from the body. The body should then be placed in a vat or round tub sufficiently large enough to scald. The temperature of water used should not be less than 150 degrees Fahr. Scald and scrape the carcass and hang up; next open from the neck upwards to the pelvis, remove the viscera, wash and finally hang to dry in a wholesome atmosphere away from flies.

After hanging over night, the head is separated from the body at the neck behind the ears; the feet and also the internal fat inside the belly are removed. The carcass is next divided into sides in the following manner.

A cut is made the whole length from tail to shoulder on either side of the backbone, which is removed, leaving the ribs intact on the sides; cut hams and shoulders off.

The pig thus cut up is ready for being salted in the following way:—

For every 100 lb. of meat take 3 lb. of coarse salt, 2 lb. of brown sugar, 1 lb. of allspice, 2 oz. saltpetre (well powdered), and 1 oz. carbonate of soda; mix well together. If the other ingredients are not available, salt and sugar in equal parts, with a little saltpetre, will give good results. If possible, rub the meat first with 1 lb. of honey for every 100 lb. of meat. Then rub with about two-thirds of the preparation until it begins to stick well, which is generally in about seven minutes. The first two days' rubbing is the most important, and unless the meat cures then it is not in a suitable condition. After such rubbing, stack the meat in a tank, first putting a thin layer of salt at the bottom; a layer of sides is put on this with the rind downwards, then another layer is crossed on this, and so on until all the bacon has been put in. After twenty-four hours, turn and rub again, adding a little more of the unused mixture, after which turn and rub once in every forty-eight hours, using a little more of the mixture each time. Place the sides which are on the top to-day on the bottom to-morrow, and so on. After twenty-one days in pickle, it is ready for washing, drying, trimming, and smoking.

SCIENCE NOTES.

THE ECONOMIC VALUE OF CERTAIN QUEENSLAND PARASITIC INSECTS.

By EDMUND JARVIS, Entomologist, Bureau of Sugar Experiment Stations.

The following notes, which were contributed by the writer to the Pan-Pacific Congress, held in Sydney during August last, proved of special interest to Economic Entomologists.

This matter was included under the general subject-heading of "Commercial Value of Useful Carnivorous Parasites"; and since dealing exclusively with little-known useful insects associated in Queensland with sugar-cane, should, I think, be brought under the notice of our growers.

(1) *Apanteles Nonagriæ* Oliff.

During the course of breeding experiments conducted by the writer at Meringa Laboratory, 1921 to 1922, it was found that the period occupied by this species from oviposition to emergence of the imagines varied from two to three weeks, under an average shade temperature of about 82 degrees Fahr.

Parasites derived from cocoons collected from bored sticks in canefields at Pyramid, near Gordonvale, were placed during 4th to 6th December in a cage containing a single caterpillar of *Phragmatiphila truncata*, Walk., which had been allowed to crawl behind a leaf-sheath of a healthy ratoon sucker previously planted in the cage. From the one female and five male braconids introduced into the latter, no less than ninety-three parasites issued from this caterpillar on 25th December (twenty-one days later). On the 28th December some of these wasps were put into another cage containing a larva of *truncata*, and only nine days later cocoons of *nonagriæ* were discovered in this cage, from which wasps finally emerged on 12th January, thus giving a period of just a fortnight for the complete life-cycle.

Apanteles nonagriæ may, perhaps, parasitise more than one species of Noctuidæ, since it probably continues to produce successive broods during summer months, although its usual host *truncata* is rarely met with here in canefields after December.

Mounted specimens of this tiny parasite were exhibited to entomologists at the Congress.

(2) *Labia* Sp. (Earwig) (Fig. 3).

This predaceous insect is exceedingly common in the Cairns district, where it occurs plentifully in canefields, hiding behind leaf-sheaths of standing cane or among the unfolding heart-leaves.

The following data regarding its habits, made by the writer in 1916, are of economic interest:—

When confined separately in large glass tubes with a portion of a cane-leaf infested with plant lice (*Aphis sacchari* Zehnm.), four of these earwigs consumed between them 120 aphides in seven hours.

Upon being introduced into the tubes they pounced without loss of time on their defenceless prey, seizing an aphid with sharp mandibles and holding the succulent morsel aloft whilst engaged in eating it. Each capture was generally followed by a quick backward movement of a few paces, the insect then standing motionless until ready for another mouthfull. It was amusing to observe, with the aid of a powerful reading-glass, how little colonies of aphides scattered in consternation as the enemy walked coolly into their midst and started snapping them up one after another with relentless indifference.

The first victims were often viviparous females, but larvæ, nymphs, and winged imagines were also devoured with equal relish.

One of these earwigs was next allowed to run up the leaf of a large growing cane-plant on which colonies of *Aphis sacchari* had been established and were breeding. About a minute after such release, having travelled 10 or 12 inches, it encountered an assemblage of plant-lice, and at once started to clear them off, eating a dozen or more with scarcely a pause, in a manner that left no room for doubt regarding the nature of one of its favourite foods under natural conditions.

When examined four days later the foliage of this plant was perfectly clean and not an aphid could be found on it.

This species is positively phototropic in a very marked degree towards artificial light, such illuminants as acetylene or benzene being especially attractive.

The imago varies in length from 13 to 16 mm., and is of a general dark reddish-brown colour, with thorax, tegmina, and legs light-yellow, and a conspicuous brown stripe down the centre of wing-covers. The anal cerci of the male are longer and more slender than those of the opposite sex, and much widened at the base internally in the form of an obtuse triangle (see Fig. 3 on accompanying plate).

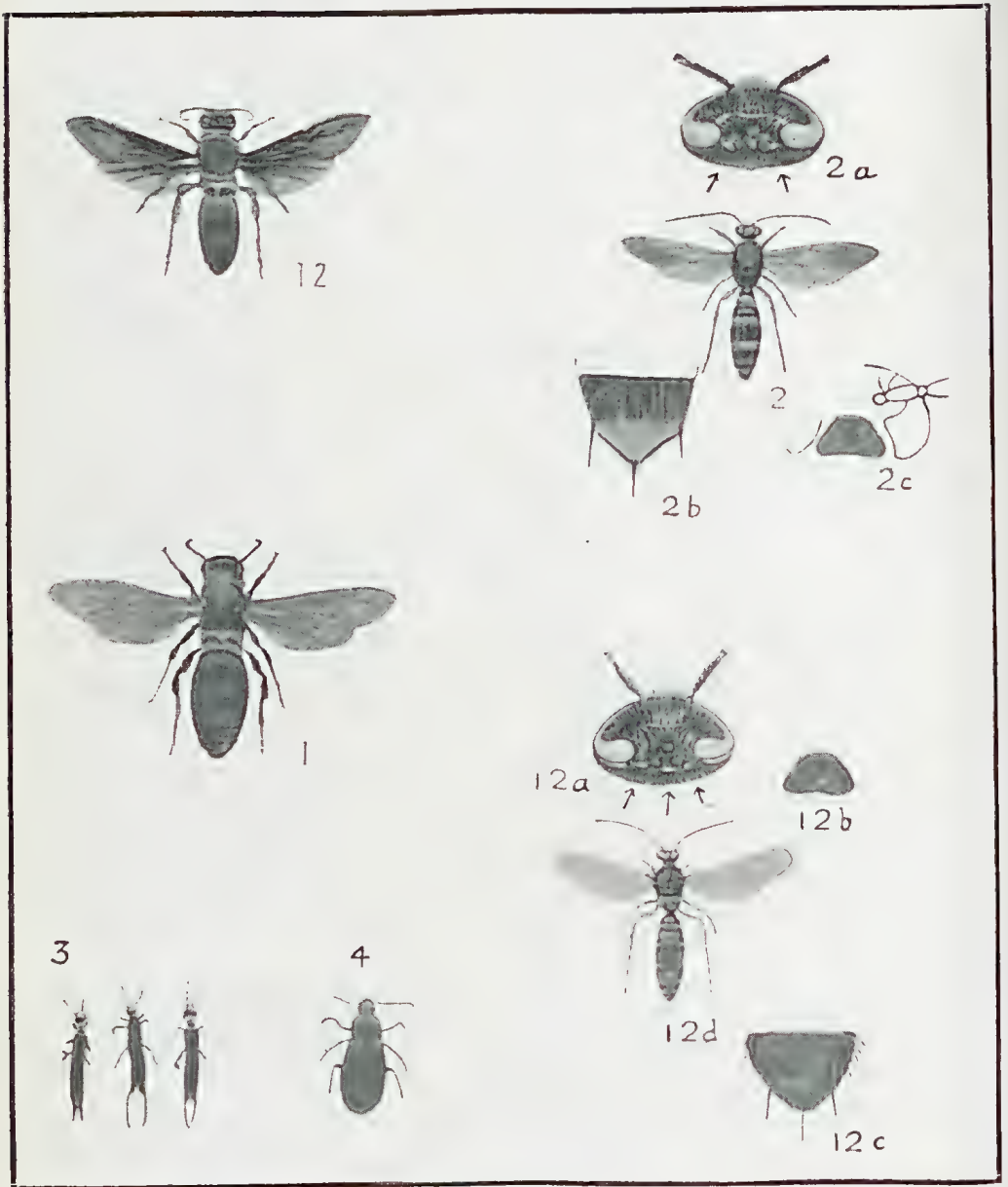


PLATE 38.

Fig. 1. *Campsomeris tasmaniensis* Sauss. Natural size.

Fig. 2. Male of same. Natural size. 2a.—Head, showing two characteristic small yellow spots, $\times 5$. 2b.—Pygidium of same $\times 9$. 2c.—Labrum, with central dark spot.

Fig. 12. *Campsomeris radula* Fabr. 12d.—Male of same. 12a.—Vertex with three yellow spots. 12b.—Labrum, plain. 12c.—Pygidium of same.

Fig. 3. Predaceous Earwigs (*Labia* sp. ?). Natural size.

Fig. 4. *Chalaenius australis* Dej. Natural size.

Living specimens, which had been captured at Meringa during July, were exhibited in Sydney at the Pan-Pacific Conference. About fifty of these earwigs were transported safely in a couple of glass test tubes measuring 7 by 1½ inches, the mouth being plugged with cotton-wool, while provision was also made for indulgence of the thigmotropic habits common to Forficulidæ. These specimens continued alive and healthy in the tubes for two months or longer, requiring little or no attention during that period; so that the introduction of this useful predator into other countries to combat injurious species of Aphidæ could be very easily effected.

(3) *Chalaenius australis* Dej. (Fig. 4).

Larvæ of this eminently predaceous beetle were observed by the writer during February, 1920, destroying caterpillars of *Laphygma exempta* Walk., which were devouring the leaves of maize and sugar-cane on a plantation at Meringa, near Cairns.

They occurred in the affected area rather commonly, attacking chiefly any caterpillars traversing the ground between cane-stools, but also exploring the foliage in search of larvæ.

Directly one of these predators encountered a caterpillar it instantly buried its keen mandibles deeply in the body near the head, and then simply hung on, while the unfortunate victim vainly endeavoured to shake off its foe, twisted and rapidly rolled over and over convulsively. Such struggles seldom lasted more than a minute, at the end of which time even large caterpillars became too weak to offer further resistance, and suffered the enemy to greedily imbibe their life-juices until its body was swollen and could hold no more.

This larva, which runs with agility, is exceedingly active and pugnacious, residing mostly underground in small holes, sun cracks, or other suitable cover.

Specimens in captivity were fed on noctuid larvæ and pupæ, and soon pupated at the bottom of breeding-cages filled with damp soil.

The pupal condition during March (one of our hottest months) lasted only seven days, the mean temperature at the time being about 87 degrees Fahr.

In general appearance this larva is black, of typical campodeoid form, and slightly exceeds 13 mm. in length (*see* illustration in "Queensland Agricultural Journal," vol. xvi., p. 279).

This useful beetle is 16 mm. long, with prothorax and head shining green above and deeply punctulate; elytra dark-brown edged with green, and often suffused with iridescent pink, each elytron with eight parallel rows of punctures. Ventral surface of body and legs shining black; palpi and basal joints of antennæ reddish-brown (Fig. 4 on plate).

Its transportal into other sugar-growing countries during the imago condition should be a simple matter.

(4) *Campsomeris tasmaniensis* Sauss. and *C. radula* Fabr. (Figs. 1 to 12d).

During our six warm months of the year (October to March) while the temperature averages about 80 degrees Fahr., the life-cycle of these parasites occupies a period of forty-seven days, three of which are taken up by the egg, and eight by the larval condition, while about thirty-six days represents the intra-cocoon stage.

The table below indicates extreme measurements met with in adult females of both these scoliids, together with the average length and width of second and third-stage grubs of each of the six hosts parasitised by them.

MAXIMUM AND MINIMUM LENGTHS AND WIDTHS OF FEMALE DIGGER-WASPS.

				Minimum.	Maximum.
<i>Campsomeris tasmaniensis</i> Sauss.	..	..	..	22 × 5.50 mm.	30 × 7 mm.
<i>Campsomeris radula</i> Fabr.	..	..	..	16 × 6.50 mm.	27 × 6 mm.

Average size of Hosts (natural curved form) ..				2nd instar.	3rd instar.
<i>Lepidoderma albohirtum</i> Waterh.	..	..	..	22 × 7.50 mm.	30 × 12 mm.
<i>Lepidiota frenchi</i> Blackb.	..	..	..	16 × 6.50 mm.	25 × 10 mm.
<i>Lepidiota rothei</i> Blackb.	..	..	..	9 × 4 mm.	14 × 6.75 mm.
<i>Lepidiota caudata</i> Blackb.	..	..	..	21 × 7 mm.	29 × 11 mm.
<i>Anoplognathus boisduvali</i> Boisd.	..	..	..	16 × 5 mm.	24 × 9 mm.
<i>Dasgynathus australis-dejeani</i> MacL.	..	..	..	12 × 6 mm.	18 × 10 mm.

These parasites are to be met with on the wing practically throughout the year, and will oviposit readily on grubs in cages, even during the winter months.

Grubs nearing the end of the second instar appear to be readily victimised by these scoliids. We have records, for instance, of wasps of average size ovipositing on small second-stage grubs of *frenchi*; and conversely of females below average size parasitising big third-stage grubs of *albohirtum*.

Such willingness to oviposit on any host grubs chancing to be available, whether large or small, while naturally enhancing the economic value of these wasps in Queensland, would add greatly to their usefulness in other countries into which they might be introduced as desirable controlling agents against root-eating scarabæid larvæ.

Number of Eggs Obtained from a Single Female Wasp.

The following data accumulated by the writer during 1917 to 1919 will be of interest to parasitologists:—

C. tasmaniensis (female caught in canefield)—

Laid 65 eggs, produced 26 wasps = 13 male, 13 female.

C. radula (female captured in canefield)—

Laid 25 eggs, produced 18 wasps = 8 male, 10 female.

C. radula (3 females caught in canefields)—

No. (1)—Laid 23 eggs, produced 17 wasps = 8 male, 9 female.

No. (2)—Laid 34 eggs, produced 5 wasps = 2 male, 3 female.

No. (3)—Laid 49 eggs, produced 11 wasps = 2 male, 9 female.

C. tasmaniensis (females bred in office; presumably unfertilised, although a male wasp was placed in same cage)—

No. (1)—Laid 95 eggs, produced 88 cocoons, and 42 wasps; all males.

No. (2)—Laid 62 eggs, 45 cocoons, 34 wasps; all males.

C. radula (female bred in office; presumably not fertile, although a male wasp was confined in same cage)—

Laid 69 eggs = 51 cocoons, 32 wasps; all males.

C. radula (females bred from eggs laid in office; no male put in cage, but purposely kept unfertilised)—

No. (1)—Laid 19 eggs, produced 6 wasps = 5 male, 1 female.

No. (2)—Laid 19 eggs, produced 4 wasps; all males.

C. tasmaniensis (females of second generation bred in office and purposely kept from male wasps)—

No. (1)—Laid 84 eggs = 45 cocoons, 38 wasps, 37 male, 1 female.

No. (2)—Laid 43 eggs = 24 wasps; all males.

C. radula (females of second generation bred in office, and kept unfertilised)—

No. (1)—Laid 47 eggs = 38 cocoons, 32 wasps; all males.

No. (2)—Laid 31 eggs = 20 wasps; all males.

C. radula (female wasp of third generation bred in office and kept from male)—

Laid 17 eggs = 4 cocoons, 2 wasps; both males.

MAIZE FOR PIGS.

Maize is Queensland's best crop for pigs, but maize must be fed in conjunction with other crops or concentrated foods rich in protein and mineral matters, to secure satisfactory results. Pigs fed on maize alone are slow growers, and are unprofitable. The pig raiser is advised to grow crops such as lucerne, sorghums, rape, and skinless barley, wheat, oats, sugar-cane, arrowroot, peanuts, sweet potatoes, mangels, sugar beets, artichokes, chow moellier and kale, pumpkins and melons, panicum, millets, and grasses, and provide abundant succulent pasture. These foods combined with maize and dairy by-products, skim milk, butter milk, and whey provide the bulk of the pig's requirements. The Queensland climate is favourable to the growth of all the crops required for successful pig farming, but it is necessary that the foods should be properly balanced and fed to the greatest advantage.

MOUNT GRAVATT EGG-LAYING COMPETITION.

The following are the scores for the month of June, the average per bird being 15.6 eggs :—

SECTION 1.**LIGHT BREEDS.**

Name.	Breed.	A.	B.	C.	D.	E.	F.	Month	Total.
W. and G. W. Hindes	White Leghorns	61	62	49	55	58	55	125	340
H. T. Britten	Do.	49	62	55	48	57	38	119	309
Kidd Bros.	Do.	62	58	26	57	49	51	94	303
W. H. Flowers	Do.	40	38	57	42	63	61	111	301
Oakleigh Poultry Farm	Do.	45	59	47	37	56	56	109	300
John T. McLachlan	Do.	61	60	56	32	34	21*	99	293
Arch. A. Stirling ..	Anconas ..	48	55	59	47	36	45	91	290
W. D. Melrose	White Leghorns	29*	56	61	46	63	15	111	289
T. W. Honeywill ..	Do.	51	63	45	39	54	29	100	281
S. Grenier	Do.	23*	41	49	43	53	52	108	273
J. E. G. Purnell ..	Do.	50	34	41	48	47	52	112	272
Mrs. R. E. Hodge ..	Do.	60	52	33	57	38	29	112	269
G. W. Cox	Do.	45	30	55	29	63	45	69	267
H. Fraser	Do.	54	48	36	58	28	40	88	264
W. Wakefield	Do.	1	51	46	45	56	60	78	259
Mrs. L. Anderson ..	Do.	52	35	39	27	51	50	120	254
R. C. J. Turner ..	Do.	55	52	20	41	15	62	87	245
L. Bird	Do.	59	52	44	3	45	39	108	242
Chris. A. Goos ..	Do.	3	52	45	62	32	37	73	231
Arch. Neil	Do.	50	49	29	48	20	32	103	228
T. H. Craig	Do.	46	33	32	42	17	56	89	226
L. J. Silman	Do.	51	47	43	26	31	24	79	222
T. W. Biddulph ..	Do.	58	51	3	35	25	46	68	218
J. W. Newton	Do.	44	28	24	26	45	30	86	197
G. Marks	Do.	60	29	25	21	27	31	97	193
H. P. Clarke	Do.	24	28	34	39	40	24	96	189
W. McHardie	Anconas ..	38	27	18	35	28	35	62	182
Ancona Club, Pen 1	White Leghorns	24	20	38	43	34	1	83	160
Geo. Williams	Do.	36	38	18	22	29	16	64	159
B. Driver	Do.	22	9	11	61	33	20	55	156
Ancona Club, Pen 2	Do.	32	27	9	23	28	17	56	136

SECTION 2.**HEAVY BREEDS.**

James Potter ..	Black Orpingtons	61	69	59	61	58	33	115	341
James Hutton ..	Do.	47	70	62	45	63	54	125	341
H. M. Chaille ..	Do.	42	51	55	45	64	26	106	284
Kidd Bros.	Do.	47	18	48	46	61	48	96	268
Carinya Poultry Farm	Do.	43	28	57	43	41	54	123	266
W. and G. W. Hindes	Do.	25	51	34	46	66	29	134	251
F. W. Lenny	Do.	52	22	60	31	23	38	114	226
E. Walters	Do.	5	5	24	66	66	58	87	224
R. Burns	Do.	46	34	40	36	27	26	121	207
Mrs. A. E. Gallagher	Do.	26	51	31	28	25	26	108	187
Mrs. A. Kent	Do.	34	53	15	35	11	39	58	187
J. Ferguson	Do.	1	34	36	33	19	10	70	133
H. G. Stevens	Do.	11	28	1	34	1	33	59	108
E. C. Stead	Wyandottes	..	33	..	2	..	20	45	55

* Replaced bird.

P. RUMBALL, Supervisor.

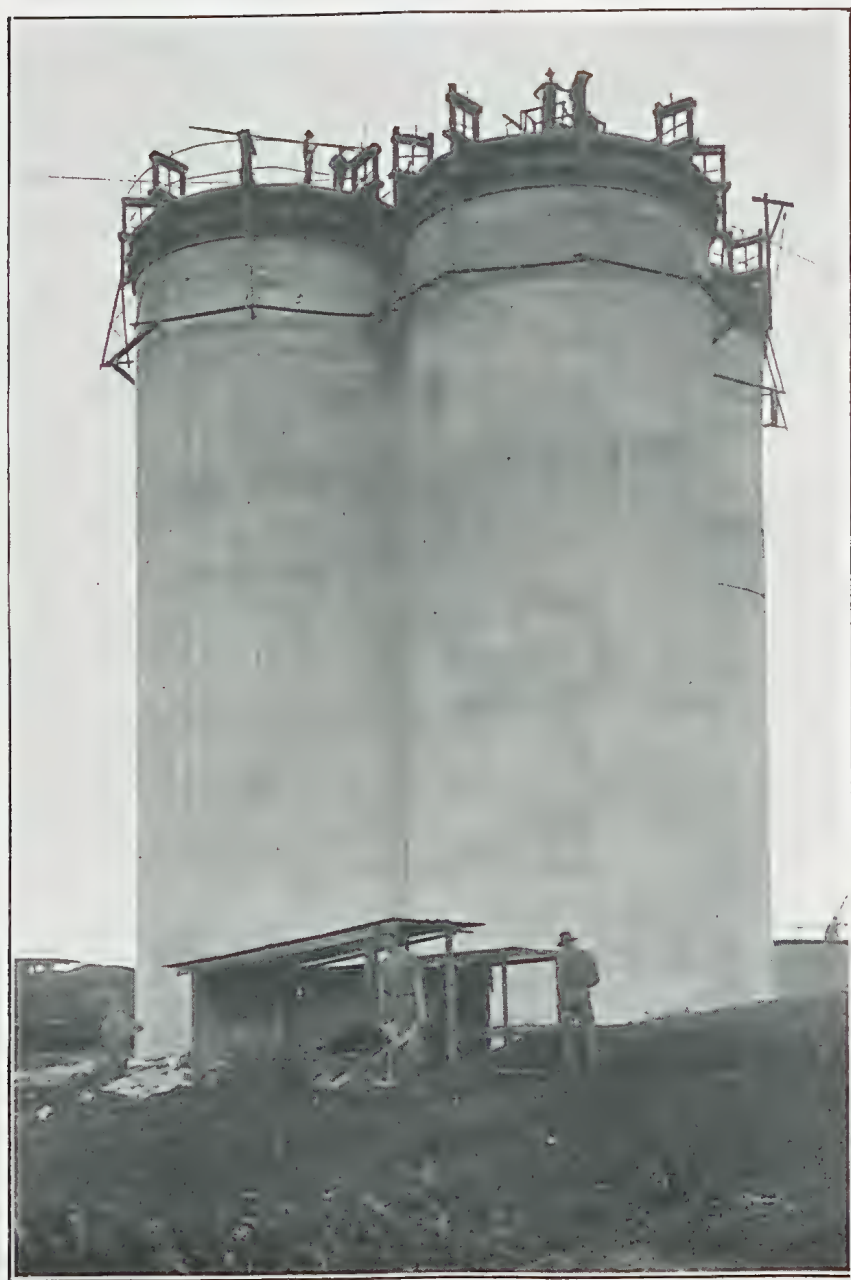


PLATE 39.—MAIZE SILO AT TOLGA, ATHERTON TABLELAND, NEARING COMPLETION.

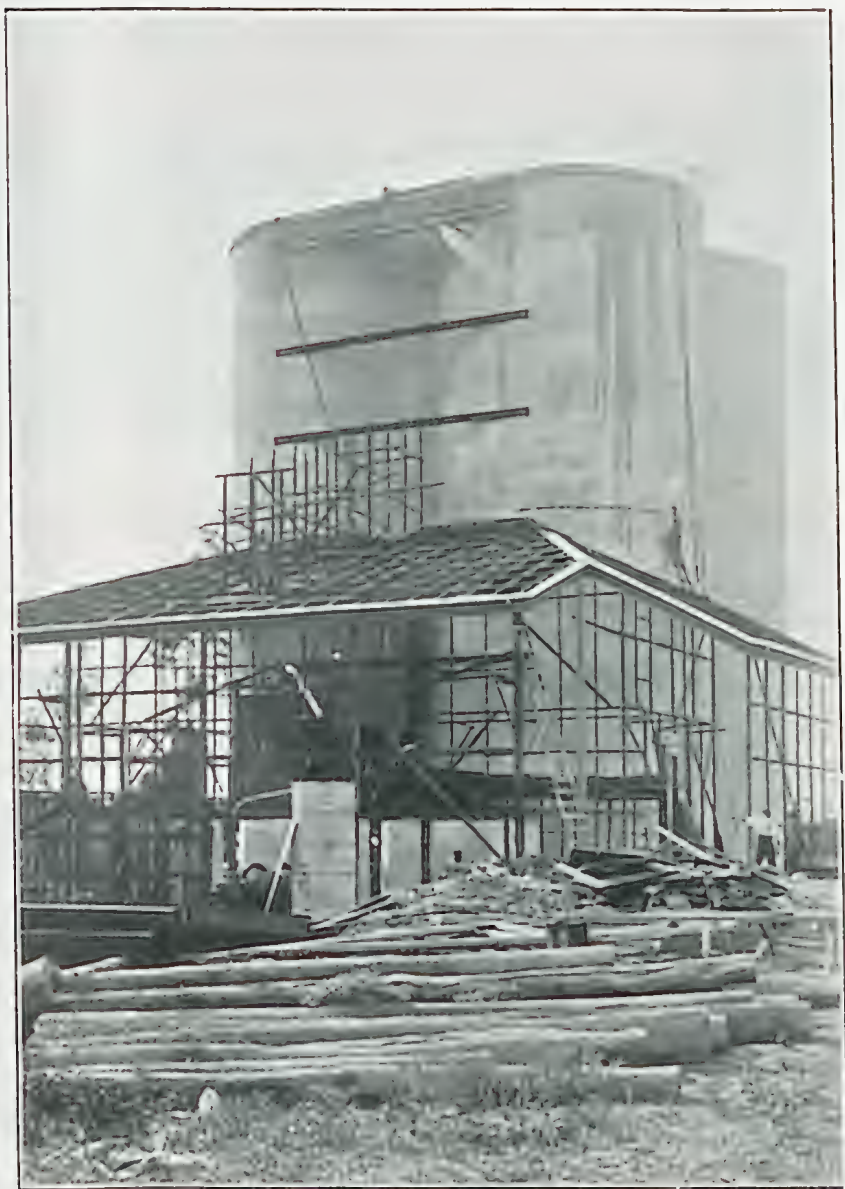


PLATE 40.—MAIZE SILO AT ATHERTON, NEARING COMPLETION.

To be controlled by the Atherton Maize Pool Board. In the foreground is the framework of the receiving and drying shed.



Photo. Arthur Jones.]

PLATE 41.—AN ATHERTON VIEW.

Showing Grain Silos erected recently for the Atherton Tableland Maize Board.



PLATE 42.—A SAMPLE OF A FINE BIRKDALE STRAWBERRY CROP.

Grown without irrigation in fertilised soil by H. Sturman.
Weight, $1\frac{1}{2}$ oz. Some of the berries in the same crop weighed up to 2 oz. **

MEAT INSPECTION AND PUBLIC ABATTOIRS.

In the course of a recent Press statement the Minister for Agriculture and Stock (Hon. W. N. Gillies) said: That Brisbane is behind the times in its method of slaughtering stock for human consumption no one with any knowledge of the subject will deny, and public abattoirs for this most populous part of the State are, in his opinion, long overdue. All the same, he denied the inferential charge that the conditions existing with regard to the handling of meat and the inspections of same are worse than they were. In fact, he claimed, and it will be admitted by those who have taken an interest in the matter, that both the condition of the premises and the inspections have improved very much since he took over the Department five years ago. There were then thirty-eight slaughter yards in the metropolitan and suburban areas; now there are forty-one, and practically all those premises which did not comply with the Act have been either rebuilt or improved in accordance with the fifth schedule of the Act.

Three new Inspectors have been appointed, and in addition two of the Veterinary Officers have been deputed to make periodical visits of inspection to all the premises, and, further, four officers are detailed for duty at the bacon factories where the inspections are continuous.

The provision of the minimum-sized slaughter-house, built on up-to-date principles, with concrete floor, proper drainage facilities, and an adequate water supply for cleansing purposes, is now insisted upon.

It has been stated in the Press that a leading medical authority referred to Fluke and Trichina as being dangerous to human beings. He was correct in saying that there is at least considerable doubt in the minds of authorities regarding Fluke, and also as to the existence of Trichina in this State at all. The condemnations on account of tuberculosis are very light, and the latest returns show the following percentages of the total number of carcasses inspected:—Cattle, 2109 per cent.; calves, 4005 per cent.; pigs, 570 per cent.; sheep and lambs, nil.

It is true that Brisbane is the only capital city without public abattoirs; but, all the same, on the latest figures the death rate of our city is the lowest but one in the Commonwealth.

Abattoirs Recommended.

With the establishment of public abattoirs the inspection of meat can not only be cheapened but it can be made perfect, continued Mr. Gillies, and on their establishment alone can the public be guaranteed that its meat supply is absolutely pure.

The Queensland Labour platform provides for municipal ownership of abattoirs, and the Greater Brisbane Bill will make provision for same. The municipal form of control operates in all the Australian abattoirs, with the exception of Homebush and Kalgoorlie, which are State controlled, the former by a Board appointed under the Minister for Health.

Adelaide and Newcastle are, it is believed, amongst the more successful of municipal undertakings in the Southern Hemisphere. The Adelaide establishment (which cost over £350,000 to build and equip) like Newcastle, is managed by a Board consisting of representatives of the various Local Authorities within the sphere of its operations. The Adelaide scheme provides for the holding of stock sales two days per week in the adjoining saleyards, at which butchers purchase the live stock required by them. Such stock, if required for immediate consumption, is handed over in accordance with proper regulations to the superintendent for slaughter; if not required immediately, they are despatched to paddocks adjoining until further notification.

All slaughtering, chilling, and delivery of meat is done by the abattoirs authorities at fixed charges, which are accepted as reasonable. Until handed over for slaughter all stock remains in the hands of the salesmen or purchasers, who are alone responsible for losses, though the abattoirs authorities will padlock same at a fixed charge per head per day. All hides, skins, and edible offal remain the property of the butchers. Fat and some other portions are purchased by the abattoirs. Blood and unedible offal is the property of the abattoirs and is allowed for by average in the charges made for treatment. In carrying out this system very little difficulty is now experienced. The organisation and supervision are said to be so perfect that it is quite a rare occurrence for any claim to be made by butchers for mistakes in delivery.

Mr. Gillies mentioned that suggestions had been put forward from time to time that one of the existing meatworks might be utilised, and that a combination of abattoirs and meatworks was worthy of consideration.

In the establishment of abattoirs, in his opinion, every other consideration should be subordinated to that of public health. The Wolston site of 2,600 acres, set apart by the present Government, has much to commend it. It has, perhaps, all the advantages of every other site, with the exception of water frontage for shipping facilities. There is plenty of room, it is convenient to rail and road, and not too far from the city.

Following the recommendation of the Royal Commission on the Meat Industry in 1913, the Department of Agriculture and Stock gave consideration to the establishment of abattoirs, the estimated cost of which, at that time, was £150,000. The scheme provided, in addition to the metropolitan area, for such places as Ipswich, Goodna, Corinda, Rocklea, Wynnum, Manly, Cleveland, Sandgate, and Zillmere, and possibly Strathpine, Petrie, Caboolture, Beenleigh, and Southport.

The latest figures go to show that in the metropolitan area approximately 60,000 head of cattle, 32,000 head of sheep, 25,000 calves, and 15,000 pigs are slaughtered per annum. In addition to the establishment of abattoirs, of course, a central dépôt in the city, with sub-dépôts at other convenient points, would be needed where the chilled carcasses, &c., would be delivered by train, whence delivery by cart or lorry to the shops would take place under proper supervision.



PLATE 43.—THE "EMPIRE CHALLENGE CUP."
(Value Twenty Guineas).

The cover is surmounted by the globe of Dominion, supported on the heads of four Berkshire Pigs. The Cups are executed in hand-beaten and wrought silver and with the oak base are 17 in. high.

The Society awards Empire Challenge Cups to the Champion Berkshire Pigs at the principal Shows in the Dominions, 2 in Canada, 2 in South Africa, and 2 in Australasia.

The subject of securing a Cup for competition among Queensland Breeders will be discussed at the Annual Meeting of the Queensland Board of the Berkshire and Yorkshire Society on Wednesday, 13th August, at Affleck House at the Show Grounds, Brisbane.



Photo. H. Mann.]

PLATE 44.—A FINE COULSTON LAKE'S MAIZE CROP, GROWN BY HENRY MANN AND SONS ON THEIR DELAMERE PROPERTY.

The Seed, improved Yellow Dent, was obtained from the Department of Agriculture. The stalks attained a height of 14 feet and carried cobs of uniform size and true to type.



Photo. Randolph Bedford.]

PLATE 45.—THE HEALTHY WEST—A YOUNG QUEENSLAND FAMILY
AT MOUNT MARGARET, SOUTH OF EROMANGA.

FORTHCOMING SHOWS.

Royal National: 11th to 16th August.
Gympie: 20th and 21st August.
Herbert River-Ingham: 22nd and
23rd August.
Belmont: 23rd August.
Imbil: 27th and 28th August.
Coorparoo: 30th August.
Crow's Nest: 4th September.
Wynnum: 6th September.
Pomona: 10th and 11th September.
Esk Bushman's Carnival: 10th and
11th September.

Beenleigh: 11th and 12th September.
Zillmere, 13th September.
Narangba: 20th September.
Melbourne Royal: 18th to 27th
September.
Stephens: 20th September.
Rocklea: 27th September.
Kenilworth: 2nd October.
Toombul: 3rd and 4th October.
Southport: 10th October.



PLATE 46.—THE TRACTOR SCHOOL AT GATTON—AN INTERESTING GROUP.

General Notes.

Maize in Second-hand Potato Bags—A Southern Prohibition.

The New South Wales Department of Agriculture has drawn the attention of the Queensland Department to the fact that a large quantity of maize is being forwarded from this State to New South Wales in second-hand potato bags.

Used potato bags may be a medium for the conveyance of spores of many potato diseases, and the regulations of New South Wales are levelled against the use of second-hand containers.

All producers or agents, therefore, who are forwarding maize in second-hand potato bags, are warned that the entrance of such bags into New South Wales is prohibited, and that, if they continue to forward such bags filled with maize or any other product, such maize or product will not be permitted entry into that State.

Cheese Consumption.

Interest has been aroused in the campaign launched recently by cheese distributors in Melbourne with a view to stimulating the home consumption of cheese. Cheese manufacturers gave this subject their attention towards the end of last March, when stocks of the commodity had so accumulated as to cause grave concern, and the advisability of export as a means of relieving the situation was then discussed.

Figures submitted in regard to future prospects indicated that during April, May, June, and July, the production of cheese would be 50 per cent. greater than for the corresponding period of last year. Supplies received in Melbourne from 1st April to date are, however, greater than the figures of last year to the extent of 100 per cent. Those connected with the industry are not only concerned with the accumulation of stocks, but they consider that the difficulties at present existing are bound to recur. To ship the surplus to overseas markets may show a loss on rates prevailing locally of quite 3d. a lb. This loss actually occurred on a shipment which manufacturers agreed to make in March in order to relieve the position. It is pointed out that a large number of returned soldiers are suppliers to factories which produce cheese, and that a slump in the market will seriously affect these soldier settlers, as well as producers generally. The March shipment to Great Britain realised only about 6½d. a lb. to the factories, a price which was very unprofitable as compared with 9d. and 10d. a lb. for the cheese sold locally.

Cheese distributors agree that the campaign should be entered into thoroughly. It is recognised that it will probably be an expensive undertaking, and they consider that the expense should be borne not only by them, but also by those who are vitally concerned—the manufacturers. They also agree that the campaign should not stop with the present effort—that the desirability of eating more cheese should be brought before the public periodically until a stage has been reached when the supply and demand will much more nearly coincide, so far as local consumption is concerned. In view of the food value of cheese, and the fact that the substitution of cheese in more liberal quantities for other articles of diet will not increase the household bill, the promoters consider that they have a strong case to put before the public.

It is estimated that the energy supplied to the system by the consumption of 1 lb. of cheese is the equivalent to the energy supplied by 1.98 lb. of sirloin steak, 2.61 lb. of round, 2.52 lb. of fowl, 1.17 lb. of smoked ham, and 1.29 lb. of fresh ham. Taken over an average of five years, Australia consumed 3.47 lb. of cheese a head of population a year against 26.4 lb. in Switzerland, 13.3 lb. in the Netherlands 12.3 lb. in Denmark, 11.2 lb. in Great Britain, 9.5 lb. in Germany, 8.1 lb. in France, and 7.1 lb. in Norway.

A leading doctor who was consulted concerning the campaign to encourage the more general use of cheese as an article of diet, said that cheese contained protein—the nitrogenous element in food. It was the element in milk that was used for building up the body. It contained a certain amount of fat incorporated with it in the making. Contrary to the generally-conceived notion, if properly masticated cheese was fairly digestible. It could with advantage be used in moderate quantities daily. There were two matters which might well be taken into consideration in a campaign of this nature. To encourage a more general use of cheese as an article of diet—and it would be to the advantage of everyone to consume a great deal more cheese than at present—attention might be given to making the local product as

palatable as possible. New Zealand Stilton cheese, for example, had a vogue everywhere, and Victorian manufacturers might follow New Zealand's example in this respect. The question of price might also be considered, as the more reasonable the price the greater would be the prospect of success in the propaganda work about to be undertaken.

Need for a Forest Sense.

Forestry problems were discussed in an address given at a Rotary Club gathering in Melbourne recently by the chairman of the Forestry Commission (Mr. Owen Jones). The chairman of the Victorian branch of the Forest League (Professor W. Osborne) was the chairman for the day, and, in introducing the speaker, he referred to the fourth annual report of the Forestry Commission, which, he said, provided a scathing indictment on the ways of exponents of public policy. The recommendations of the Commission had been disregarded year after year, while every expert agreed upon the nearness of the soft wood shortage. Land that should have been reserved for forests had been opened for settlement against the advice of the Commission. The settler, after giving it a fair trial, had generally retired broken-hearted, and the once valuable land had been given over to bracken fern and rabbits.

Forestry not a Fashionable Fad.

Continuing the lecturer said that forestry was no mere fashionable fad, but it was a vital question. From the cradle to the coffin we depended on wood, and we could not live without it. The two main functions of forestry were its valuable material and its influence on climatic conditions. Everything that was produced came to market in wooden containers, on wooden drays, along wooden sleepers on the railways. Another important function was news. Telephone and telegraph messages required wooden poles, and newspapers required wood pulp for the manufacture of paper. In the United States of America alone the amount of wood used for wood pulp amounted to 15,000,000 tons a year. Sport and entertainment also depended upon wood, and many products came from the forests. It was obvious that to obtain those benefits the forests must be preserved.

The World's Soft Wood Supply.

At the Empire Forestry Conference, at which he represented Victoria last year, continued Mr. Jones, the question of the world's soft wood supply was considered. It was ascertained that a serious position existed, as only three European countries produced more timber than they used. In Canada the total consumption was 900,000,000 cubic feet a year. The ravages of fire, pests, &c., increased it by 4,000,000,000 cubic feet a year. At that rate the supply would become exhausted in twenty-five years, and the home utilisation was increasing yearly. In the United States of America the area had been reduced from 822,000,000 acres of forest to 463,000,000 acres, and it was being cut out at the rate of 5,500,000 acres a year. There were 26,000,000,000 cubic feet used every year—four times more than the estimated growth.

Australia should be Self-supporting.

It was absolutely essential, Mr. Jones stressed, that Australia should be self-supporting, as it was certain we could not depend upon other countries indefinitely for our needs. Of all the great countries in the world Great Britain had, possibly, shown the greatest apathy in regard to timber. The position was intensified in Australia owing to the conditions prevalent in a new country. There was a growing agreement that our forests must be protected, waste eliminated, and future supplies arranged for. It was only an abstract idea, however. Many people failed to realise the necessity for immediate action, others failed to see the need for forestry, while others considered that a measure of protection was all that was necessary. Forestry was a business of vital national importance; numberless industries depended upon it, and it required the application of business principles. It was also a profitable business. In India the average net income from forest lands amounted to £1,000,000 a year.

It has been freely stated that the locking up of land diminished employment and would reduce the population. Some years ago 1,200 acres of land at Warburton were offered for sale at 15s. an acre, payable in twenty years. The land carried valuable timber, and, fortunately, was withheld from settlement. A sawmill was opened there, and in ten years it cut 27,000,000 super. feet of timber, worth £250,000. The royalty of 1s. 3d. a 100 super. feet to the Ministry amounted to £17,000. The mill was still working, and the State still owned the land. Under agriculture it would have supported four men, while the mill employees numbered twenty.

Looking Ahead.

Concluding, the lecturer emphasised that forestry was a question of even greater importance to the rising generation. Timber supplies would be sufficient for the present generation, but we held the forests in trust, and could not squander the forest capital. As we received it as a free gift, so must we hand it on unimpaired. Forestry should appeal to Rotarians. Forestry, like rotary, had as its basic idea service to the community. There was a long time between seed time and harvest, and the individual forester rarely saw the result of his labour. He was worthy of all the sympathy that could be given him.

Equine Ophthalmia.

Of ophthalmia there are two forms, *i.e.*, simple ophthalmia, caused by direct irritation, or possibly by catarrhal affection; periodic ophthalmia is a constitutional disease, appears periodically without apparent cause, and after a few attacks results in blindness from cataract. Treatment in either case consists in administering a laxative, as 1½ pints of raw linseed oil. Keep the horse in a comfortable stall excluded from draughts and direct sunlight. Get a lotion made of 10 grains sulphate of zinc, 20 drops fluid extract of belladonna, and 2 ounces of distilled water. Bathe the eyes well three time daily with hot water, and, after bathing, put a few drops of the lotion into each eye. Recovery may be slow, so have patience and continue the treatment for some time if necessary.—“The Queenslander.”

Wheat Crop Prospects.

Discussing the prospects of the coming season's wheat crop, Mr. W. Binns (manager of the State Wheat Board) said recently that, as a result of the general winter rains the prospects were now good all over the wheat belt. Generally, they had been considerably improved, and although the rain would not assure a harvest, yet it would give a wonderful start to the wheat crops, which, if they got refreshers and a good downpour in September, would assure a good harvest. In the wheat area from Toowoomba to Maranoa, out to Goondiwindi and Killarney, the rain had resulted in a general increased demand for seed. He pointed out that it was not too late to sow what are recognised as middle season's wheats, such as Amby, Coronation, Warren, and Gluyas, and, of course, the planting of Florence can be carried out right up to the end of August. The prospects were really bright, and with the opportunity now afforded for further areas to be planted, prospects pointed to a harvest equal to the two years of 1920 and 1921, when the yields were 4,000,000 and 3,000,000 bushels respectively. The Board holds no stocks, except seed reserves, and, therefore, is in a position to commence operations immediately the harvesting starts.

Stretching Wool.

Mr. H. J. W. Bliss, the Director of the British Research Association of the Woollen and Worsted Industry, has announced an interesting development in connection with the spinning of wool. From tests made at the Bradford Technical College it is claimed that 20 per cent. finer counts can be obtained from a given quality of wool by stretching the fibres when wet instead of when dry. Thus, in ordinary testing, if certain lengths of woollen fibre are stretched 10 or 15 per cent. in a dry condition, the same fibres will not break when wet if extended 30 per cent. In some cases the stretching has been increased to 50 per cent. without breaking point being reached.

Working upon Mr. Bliss's idea, the Research Association devised machinery to spin wool to a finer count than would be possible with the use of the present dry process. So far, the experiments have been on a demonstration scale, but they have been carried far enough to show that the plan is worthy of careful investigation. The use of hot steam, water, and other chemical agents in connection with lower quality wool is to be tested on a commercial scale. There are many practical difficulties to be solved, but the savings promised by the method are large, in view of the great difference in value between 56's or 58's crossbreds and 64's and 70's merinoes. The suggestion of Mr. Bliss is that the cheaper crossbred wool can be made by this method to spin as fine a count as the expensive merino. To-day, an average 64's merino top is valued at 6s., whereas 56's are worth only about 4s., a difference of 2s. a pound. It has, however, to be shown that the fine crossbred wool can not only be spun in this fashion, but that it will produce cloth of equal quality. There may be an appearance of harshness in the fabric produced from the crossbred wools, and if this is so the saving may not be worth while. So much interest has been aroused by Mr. Bliss's announcement, and the prospects of profit are so great, that the scheme is certain to be tested fully during the next few months.—“Australasian.”

A Desirable Beef Type.

Armour's, the American packing company, in their booklet, "Progressive Beef Raising," define the type of steer they like best as follows:—The animal as viewed from the side should be straight in top and underline, deep, low-set, stylish in carriage, symmetrical in all parts, and possessed of a smooth, thick, meaty appearance. From the rear he should be wide throughout and even, smooth through the shoulders, hook points and rump, and deep and thick in thigh, lower round, and twist. From the front he should show a pronounced breadth from shoulder top down through the breast, his neck and shoulder vein should be plump with fat, his head short, broad, and well dished, and his legs set well apart. Such a steer will carry thick cuts in the valuable parts, and be proportionate between his carcass and the internal organs that provide his meat-making machinery. He should be thick, smooth, and mellow to the touch in all parts of his body, and as refined in bone, skin, and hair as possible without reducing his ruggedness or vigour.

The fat cattle buyer not only determines what kind of carcass the animal he buys will produce, but he also determines what the steer will yield, in terms of carcass to live weight. This is known as the dressing percentage, and depends on the condition, the freedom from punchiness, the type, and the quality. Fat steers always outdress animals of less finish, the degree of their condition being judged in accurate detail by the filling of the tongue root, brisket, shoulder vein, flank, and twist, in addition to the general covering over the body. The fill of the digestive organs with feed and water is as important as the condition. In shipping, steers of 1,200 lb. weight frequently shrink 40 to 60 lb., due to the emptying of the digestive tract, which is 3 to 5 per cent. of the entire weight of the animal.

Butter Exports for May—Queensland Leads.

During May, 468,832 lb. of butter was exported from the Commonwealth. New South Wales supplied 15,344 lb., Victoria 72,072 lb., Queensland 344,680 lb., and South Australia 36,736 lb.

Refrigerating Experiments.

Some very interesting experiments on the freezing of beef are being carried out at the Melbourne cool stores under the supervision of the Institute of Science and Industry, and the Departments of Physiology and bio-Chemistry, at the Melbourne University. It has been noticed that, while the Australian mutton which arrives in England is in good condition, the beef is damp and does not look at all attractive. The tests are being carried out in the hope that some remedy for this will be obtained, thereby enabling Australian beef to compete with the Argentine product. Mr. J. R. Vicary, a graduate in science of the Melbourne University, is supervising the tests.

America as a Market for Australian Meat.

It was stated at a Scottish cattle-breeding conference, at Edinburgh on 12th July, that the United States was reaching its limit of production in beef and mutton. The British Dominions would soon find a market there. Major Wentworth, of Chicago, thought that, within the next fifteen years, it would be possible for Australasian lamb, and, possibly, beef, to enter America, but the market would not be obtained without a struggle.

Receipt of Annual Seed Cotton—Time Extended.

The time limit fixed for the receipt at ginneries of annual seed cotton and for payment of the advance has been extended by one month—from 31st July to 31st August.

The Minister for Agriculture and Stock (Mr. Gillies) said recently that owing to the lateness of the harvest of annual seed cotton, brought about by the abnormally dry season, he had decided that annual seed cotton would be received at the ginnery until 31st August next, and that the advances for annual seed cotton received during August would be made at the same rates as if it had been delivered before 31st July, the prescribed date for closing the cotton year.

Mr. Gillies also stated that he had received notification from the Director of Agriculture, in Melbourne, to the effect that Victoria had prohibited the introduction into that State from the States of Western Australia and Queensland and from the Northern Territory of all ginned or unginned cotton and of cotton seed, unless accompanied by a certificate from the Agricultural Department of the exporting State or Territory that such cotton or seed had been treated so as to destroy any hibernating larvæ of the pink boll worm.

Cotton for the Continent.

The first consignment of cotton to be forwarded direct from Queensland to the Continent of Europe was taken by the Holland-Australia steamer *Arendserkerk*, which left recently for Genoa, Dunkirk, Antwerp, Hamburg, Bremen, and Rotterdam. It consists of ten bales. The vessel also loaded 2,000 bales of wool at this port.

The Winter Pineapple Crop.

The picking of the winter crop of pines has commenced on the North Coast, and the first truckloads have been marketed. Vegetable growers are reaping the benefit of a splendid season and good markets. The sugar expert inspected crops at Glass House Mountains, and was surprised to see crops of from 20 to 25 tons standing on land that had previously grown pineapples for seven years without a spell.

The Queensland Producers' Association.

The Petty Sessions District of Cape River has been included in District No. 2, as constituted in accordance with the Primary Producers' Organisation Acts, and the Petty Sessions District of Emerald, and that portion of the Petty Sessions District of Clermont situated to the east of the Suttor River and Mistake Creek have been included in District No. 4.

Government Clydesdale Stallions.

Applications will be received by the Under Secretary, Department of Agriculture and Stock, Brisbane, until 12th August, 1924, from owners of Clydesdale mares, in the undermentioned districts, who desire the services of a Government Clydesdale stallion during the coming season. Applicants are to state age, breeding, colour, and description. The mares entered will be examined, and if approved of, an agreement will be entered into with the owners with respect to the service. The date of such examination will be duly notified to owners. Fees for service will be two guineas (£2 2s.), and fees must be paid at or before the time of the first service. Beaudesert, Bundaberg, Beenleigh, Chinchilla, Isis, Crow's Nest, Caboolture, Maroochy, Dalby, Esk, Gayndah, Cinnabar, Woorooga, Gatton, Killarney, Laidley, Maryborough, Nambour, Oakey, Noosa, Pittsworth, Central Queensland, Toowoomba, Toogoolawah, and Warwick.

An Interesting Milk Record.

The time it may take a cow to mature and show her quality as a milker is strikingly emphasised in a record published in a recent issue of the "Journal of the Ministry of Agriculture," London. The animal (a non-pedigree Shorthorn) has been retained by her owner, contrary to his usual practice of selling cows when carrying their third or fourth calf, in order to test a remark which he had heard concerning the cow's sire, to the effect that the longer the progeny of this bull were kept the better milkers they would be.

The following annual and lactation yields confirm the accuracy of this remark:—

					Days in Milk.	Milk Yield (lb.).
Year ended 1st October, 1918	..	..	..	..	274	5,759
" " " 1919	..	..	..	..	256	6,370
" " " 1920	..	..	..	..	172	6,695
" " " 1921	..	..	..	..	246	5,745
" " " 1922	..	..	..	..	340	17,897
" " " 1923	..	..	..	..	220	12,857
Period from 1st October, 1923 to 3rd February, 1924	136	..	..	..	7,271	
2nd lactation, calf born 13th April, 1918	..	..	..	..	244	5,382
3rd " " 1st April, 1919	..	..	..	..	235	6,282
4th " " 3rd June, 1920	..	..	..	..	362	11,997
5th " " 22nd Oct., 1921	..	..	..	..	424	19,066
6th " " 13th May, 1923*	..	..	..	..	273	18,960

As will be seen from these returns the cow gave little promise in her early years of being a big milker. At the time of inspection she was reported to be in splendid condition and perfectly healthy, and was expected to pass the 2,000 gallon mark. It is stated that the owner has four other cows from the same sire which have all averaged over 1,000 gallons with their last four calves.—"Agricultural Gazette" of N.S.W.

* This last yield was up to 3rd February, 1924, when she was still in milk and giving about 40 lb. per day.

Export of Cotton—Southern Restrictions.

The Minister for Agriculture (Hon. W. N. Gillies) stated recently that he had received notification from the Director of Agriculture, Melbourne, to the effect that Victoria had prohibited the introduction into that State from the States of Western Australia and Queensland and from the Northern Territory all ginned or unginned cotton or of cotton seed, unless accompanied by a certificate from the Agricultural Department of the exporting State or Territory, that such cotton or seed had been treated, so as to destroy any hibernating larvæ of the Pink Boll Worm.

The Renovation of a Lucerne Stand.

How best to treat a three-year-old stand of lucerne which showed signs of deterioration was the problem presented to the Department by a correspondent recently. The land might, in the writer's opinion, possibly be deficient in lime. Would it be advantageous, on the showing of the sample of soil submitted, to make an application of this constituent?

The correspondent was informed that the application of lime is not recommended, as the increased growth rarely warrants the cost. Lime usually costs about £5 per ton delivered on the farm, and it is unlikely that the increased yield will be sufficient to return a profit. In this case superphosphate could probably be applied with advantage at the rate of 1 cwt. per acre early in the spring. It can be spread over the lucerne on a calm day through the fertiliser attachment of the wheat drill, the tubes being removed so that the superphosphate will be well distributed. If the weather is windy it is better to use the tubes on the drill, so that the fertiliser may be conveyed to the ground.

It is not easy to injure established lucerne, and heavy cultivations may be given. One cultivation may be given in the spring after the superphosphate has been spread, and a further cultivation after each cutting. A disc cultivator can be used for the spring cultivation, but for the later cultivations it may be better to use a spike roller or springtooth cultivator.

It may be added that pamphlets on the top-dressing of lucerne and other aspects of the cultivation of this crop are among the many obtainable free by farmers on application to the Department.—A. H. E. McDonald, Chief Inspector of Agriculture, N.S.W.

Protection of the Sugar Industry.

"The Queensland Ministry strongly supports the existing form of control which has been demonstrated by experience to afford the most effective protection to the sugar industry, and is equitable to the workers, farmers, and consumers," said the Premier (Hon. E. G. Theodore) on 15th July, when announcing that the Ministry had completed arrangements with the refining companies for the handling of the 1924 season sugar output. At the end of the present year the arrangement between the Commonwealth and the State expires. "Experience of twelve months' operations under the existing arrangement," continued Mr. Theodore, "satisfies me that a continuance is necessary for the welfare of the industry and Australia. I am satisfied that the existing arrangement, as a principle, is more advantageous to all concerned than simply tariff protection. The price of raw sugar on the world's market in February was approximately £30 a ton. To-day it is £17."

Cheese Board.

The following is the result of the ballot for the election of members of the Cheese Board:—

Henry Keefer (Pittsworth)	..	..	..	611
Henry Thomas Anderson (Biddeston)	..	..	..	589
Albert George Tilley (Rosehill)	..	..	..	503
Mads Peter Hansen (Malling)	..	..	..	430
David Gabriel O'Shea (Southbrook)	..	..	..	391
James McRoberts (Tiaro)	..	..	..	386
William Smith (Yangan)	..	..	..	320
John Lipp (Greenmount)	..	..	..	302
Robert Goodwin (Byrnestown)	..	..	..	148

As five members only are required, Messrs. Keefer, Anderson, Tilley, Hansen, and O'Shea have been elected, and will be appointed as members for the ensuing twelve months.

It is interesting to note that Messrs. Keefer, Anderson, Tilley, and Hansen, who were the retiring members of the old Board, have been re-elected. Mr. D. G. O'Shea, of Southbrook, is the new member in the place of the late Mr. J. E. Dean.

Staff Changes and Appointments.

Constable E. H. Skipper, of Tangorin, has been appointed an Inspector of Slaughter-houses.

The following changes have been made in the recent appointments of Cane Testers to Sugar-mills for the 1924 sugar season:—

Mr. J. McFie, Cane Tester, Gin Gin Mill, to be Cane Tester, Marian Mill;

Miss A. E. Levy, Assistant to Cane Tester, Maryborough Mill, to be Cane Tester, Gin Gin Mill;

Miss I. McGill, Cane Tester, Invicta Mill, to be Cane Tester, Cattle Creek Mill;

Mr. C. H. Jorgensen, Cane Tester, Cattle Creek Mill, to be Cane Tester, Invicta Mill; and

Mr. H. B. Davis has been appointed Cane Tester at Rocky Point Sugar Mill.

Mr. C. O. O'Connor and Miss E. M. Boddington have been appointed Clerical Assistants to Cane Testers at Moreton and Maryborough Mills respectively.

Mr. A. R. Henry, Secretary of the Central Sugar Cane Prices Board, has been appointed to be Temporary Chairman of that Board on all occasions when the Chairman, Mr. Justice O'Sullivan, is absent.

Cold Milk Pool.

A notice has been gazetted advising the intention of the Government to create a Pool for Cold Milk produced in that portion of Queensland within a radius of 37 miles of the General Post Office, Brisbane, and which is delivered to any portion of Brisbane within a radius of 5 miles of the General Post Office. The pool, if formed, will only apply to cold milk; and the definition of "hot milk" is, milk delivered by dairymen direct to consumers within five hours after milking. The pool will be for the period of five years from the 1st September, 1924, and will apply to both milk and cream intended for consumption, but will not apply to milk intended for cheese or condensed milk, nor cream intended for butter manufacture. The Board to administer the pool will consist of five elected representatives of the growers, together with one person to represent the Council of Agriculture, one person to represent the Queensland Government, and one person to represent the Primary Producers' Bank of Australia, which is financing the pool. The Pool Board will hold office for one year and may acquire, establish, and carry on depôts for the cold storage of milk and cream, but not for butter and cheese, and the utilisation of surplus milk by its separation into cream or skim milk. The Board may provide for the financing of the cost of the establishing of depôts by levying not more than one penny per gallon on milk supplied to the Board for the first year, and one halfpenny thereafter. In the event of the local authorities within the 37-mile radius undertaking to provide for the milk supply for the metropolis, the pool organisation and property may be transferred to the local authorities subject to payment assessed by the Land Court. If the local authorities do not take over the pool organisation before the 1st March, 1929, provision is made for the pool's plant and assets to be handed over to a milk suppliers' co-operative association, and for the issue of debentures or shares to suppliers in proportion to the levies paid by them during the currency of the pool. The persons eligible to vote at any referendum or election in connection with the Board prior to the 1st November, 1924, shall be persons who at any time since the 1st January, 1923, supplied cold milk from within the 37-mile radius to any portion of Brisbane within a radius of 5 miles of the General Post Office. The persons entitled to vote on any subsequent referendum or election shall be persons who at any time during the six months prior to the date of such referendum or election carried on the business of cold milk suppliers. The pool will be subject to the provisions of the Health Acts and the Dairy Produce Act, and shall not sell

milk or cream at prices higher than those prevailing at the time of its creation without approval of the Minister. Provision is made for the pool to subsequently take in hot milk suppliers should they so desire. Any petition for a poll to decide whether the pool shall be created must reach the Minister before the 2nd September, 1924, and must be signed by at least fifty cold milk suppliers. To insure their names being on the roll of persons eligible to vote, dairy farmers who will be affected by the pool are invited to send their names and addresses to the Department of Agriculture and Stock at once. Nominations for membership on the Board will be received by the Under Secretary, Department of Agriculture and Stock, until the 23rd August, 1924. Each nomination must be signed by at least ten growers.

The Crow as a Pest Destroyer.

The crow seems to be coming into his own at last, and his undoubted services are gradually gaining recognition, though he has suffered much for the sins of his cousin, the raven. Hitherto only a few bird-lovers have had a good word for the "black devil," the most unpopular of birds. One of the most pressing problems of the settler in any part of this country is the blowfly pest, which causes immense annual loss among sheep. The crow plays an important part in eradicating the blowfly and preventing the spread of disease by his predilection for rotting carcasses—the breeding ground of the pest—and for blowfly maggots. He also destroys vast quantities of other harmful insects, especially locusts (grasshoppers). But there is an important difference between the useful crow and the scoundrelly raven, though they are commonly confused. The raven is the larger bird, with a louder and hoarser voice, and has uniformly black feathers. The feathers on the back and neck of the crow are pure white at the base. It is the raven which steals eggs and chickens, raids newly-sown crops, and plucks out the eyes of living animals when they are helplessly weak in times of drought. But, on the whole, the less common crow is a useful bird in many districts, and should not be exterminated.—"Queenslander."

Broom Corn Millet.

The Minister for Agriculture and Stock (Hon. W. N. Gillies) advises that a proclamation dated 26th June, 1924, has been received from the secretary to the Agricultural Ministers' Conference, Sydney, in which it is stated that, owing to the danger of introducing the European corn borer (*Pyrausta nubilalis*), the importation into Australia of broom corn millet is prohibited, unless on arrival it is subjected to steam disinfection.

Beware of the Bull.

Every year, because of thoughtlessness or carelessness, some men are killed by bulls. And usually it is the safe bull that does the killing! Every man working with cattle should always remember that all bulls are dangerous, and that care and thought must be exercised in working about them. Always play safe in working with bulls. Always ring a bull when he is about one year old. For the first year use a small ring, and later put in a large one. Do not leave a small ring in a mature bull; it is unsafe. Always use a staff (the best is none too good) in handling a bull two years old or over—it is better than life insurance.—"Live Stock Journal."

Rebate on Sugar.

Under the arrangement between the Commonwealth and State Governments, the rebate on sugar in exported products is fixed by a board designated the competent authority. The authority, comprising Mr. Justice O'Sullivan, chairman; Mr. J. Musgrave, Acting Collector of Customs, representing the Commonwealth; and Mr. G. H. Pritchard, representing the State, has met, and fixed the sugar export rebate, as from 1st July, at £10 13s. per ton on sugar contained in jam, canned fruit, preserves, and milk, and £12 per ton on sugar in other goods.



PLATE 47.—A GOOD STAND OF PLANT CANE AT GLASSHOUSE MOUNTAINS.

The variety is Q.813 and was planted by Mr. W. R. Day, Montcalm, and is showing seven months' growth. The height of the man in the picture is 5 ft. 8 in.

SUCCESSFUL PIG RAISING.

The three outstanding features of successful pig raising are:—

1. Knowledge of the job, personal attention to all details of management, reliable breeding stock and a good farm.
2. Efficiency in all operations, keeping an ever watchful eye on the growth and development of each animal, studying carefully the costs of production.
3. Co-operation in developing the industry, in the production of all food supplies on the farm, in the marketing of the stock, and in uplifting the industry by co-operating with the Department of Agriculture and Stock in its efforts to keep disease out and to place the industry on a successful basis.



Photo. Randolph Bedford.]

PLATE 48.—CROSSING A FLOODED CREEK ON TOBERMORY,
WESTERN QUEENSLAND.

PLANT BREEDING IN RELATION TO COTTON.

Many persons imagine that all that need be done is to import sufficient seed of a good variety from America in order to plant our cotton area here, but this, unfortunately, is not possible in practice. In the first place all seed that is imported from America has to come from a source certified by the U.S.A. Department of Agriculture, must be fumigated, and, if possible, delinted with sulphuric acid. This, therefore, limits us to the importation of small quantities of seed since these quarantine precautions are absolutely necessary if we are to keep out exotic diseases and pests. Secondly, any variety which is newly imported shows what is known as "new place effect," *i.e.*, it is inclined to vary in staple, habit of growth, and other characters, and become uneven. This phenomenon is well known in other countries, and is probably caused by the variety making an effort to acclimatise itself to the new conditions. It has already been observed in the Durango variety which was imported into Queensland three years ago, and it has become abundantly obvious that we shall have to adopt careful methods of selection within this variety if we are to get types particularly suited to this country. Further, in such an extensive country as Australia, it is perfectly obvious that one variety will not suit all parts of the cotton belt, and we shall therefore have to breed cottons to suit particular localities.—G. EVANS, Director of Cotton Culture.



Photo. Randolph Bedford.

PLATE 50.—A BANANA GROVE, NORLEY STATION, THARGOMINDAH,
WESTERN QUEENSLAND.



Photo. Randolph Bedford.

PLATE 49.—A GLIMPSE OF THE GARDEN, NORLEY, THARGOMINDAH,
IRRIGATED FROM A BILLABONG ON THE BULLOO RIVER.

The garden is flooded fortnightly in winter and weekly in summer.

HOW AMERICA DISPOSES OF HER MAIZE CROP.

More than 80 per cent. of the United States maize crop is fed to livestock, and somewhat less than 10 per cent. is used for human food. The pig is the largest consumer, more than 40 per cent. being fed to pigs on the farms. Horses and cattle come next, using 20 to 15 per cent., respectively. The export of grain, as grain, has never been large. Queensland can do the same. Increased production of maize emphasises the importance of better pigs on every farm.

AMERICA'S CONSUMPTION OF MEAT.

The estimated total quantity of meat consumed in the United States during the year 1923 was 18,481,000,000 lb. Of this amount the details are:—10,113,000,000 lb. pork; 6,918,000,000 lb. beef; 873,000,000 lb. veal; 574,000,000 lb. mutton and lamb; 3,000,000 lb. goat. This represents an increase of 2,000,000,000 lb. over the average of the last four years, with a *per capita* increase of about 18 lb.

BACON FACTORIES OPERATING IN QUEENSLAND.

The bacon factories operating in Queensland are:—Queensland Co-operative Bacon Co. Ltd., Murarrie; Foggitt, Jones and Co., Ltd., Oxley; J. C. Hutton Pty., Ltd., Zillmere; Reeds Ltd., Maryborough; Darling Downs Co-operative Bacon Co. Ltd., Willowburn, *via* Toowoomba; Warwick Bacon Co., Mill Hill, Warwick; and North Queensland Co-operative Bacon Co., Floreat Siding, Mareeba, North Queensland.

The annual output of these combined factories represents, approximately, a total of £1,000,000. There is ample room for expansion; all these factories will willingly increase their capacity as soon as the increased number of pigs is available.

THE IMPORTANCE OF PIG RAISING.

For the three months ended November, 1923, Great Britain imported 2,467,746 cwt. of bacon and hams, equal to 2,500,000 pigs. These were supplied by Denmark, 1,000,000; United States of America, 900,000; Canada, 300,000; and other countries, 300,000.

In other words, Great Britain in three months imported bacon equal to more than two and a-half times the total number of pigs in the Commonwealth of Australia. Queensland's share in these imports was nil. The opportunity offers for Queensland to enter the rank of exporters of hams and bacon to Great Britain and the wider fields in the East.

A FINE MAIZE YIELD.

A return of 284 bags of prime maize has recently been threshed from a 9-acre paddock, the property of Councillor T. J. Howell, and grown by Mr. James Lamb, Killarney. Although the crop suffered from two set-backs in the earlier stages, it still yielded over thirty-one bags to the acre. This particular paddock has been cropped for more than twenty years, and never at any time has any fertiliser been used. Mr. Lamb grew a crop of thirty-three bags to the acre on the same paddock two years ago.

Farm and Garden Notes for September.

With the advent of spring, cultivating implements play an important part in farming operations.

The increased warmth of soil and atmosphere is conducive to the growth of weeds of all kinds, particularly on those soils that have only received an indifferent preparation.

Potatoes planted during last month will have made their appearance above the soil, and where doubt exists as to their freedom from blight, they should be sprayed with either Burgundy or Bordeaux mixture as soon as the young leaves are clear of the soil surface.

Land which has received careful initial cultivation and has a sufficiency of sub-surface moisture to permit of a satisfactory germination of seeds may be sown with maize, millets, panicum, sorghums, melons, pumpkins, cowpeas, broom millets, and crops of a like nature, provided, of course, that the areas sown are not usually subjected to late frosts.

Rhodes grass may be sown now over well-prepared surfaces of recently cleared forest lands or where early scrub burns have been obtained, and the seed is sown subsequent to showers. More rapid growths, however, are usually obtainable on areas dealt with, say, a month later.

In connection with the sowing of Rhodes grass, farmers are reminded that they have the Pure Seeds Act for their protection, and in Rhodes grass, perhaps more than any other grass, it is necessary that seed of good germination only should be sown. A sample forwarded to the Department of Agriculture will elicit the information free of cost as to whether it is worth sowing or not.

Where the conditions of rainfall are suited to its growth, paspalum may be sown this month.

The spring maize crop, always a risky one, requires to be sown on land which has received good initial cultivation and has reserves of soil moisture. Check-row seeding in this crop is to be recommended, permitting as it does right-angled and diagonal cultivation by horse implements, minimising the amount of weed growth, and at the same time obtaining a soil mulch that will, with the aid of light showers, assist to tide the plant over its critical period of "tasselling."

Although cotton may be sown this month, it usually stands a better chance if deferred until October. The harvesting of cotton during the normal rainy season is, if possible, to be avoided.

The sowing of intermediate crops prior to the preparation of land for lucerne sowing should be carried out in order that early and thorough cultivation can take place prior to the autumn sowing.

The following subsidiary crops may be sown during the month:—Tobacco and peanuts, plant sweet potatoes, arrowroot, sugar-cane, and cow cane (preferably the 90-stalked variety), and in those districts suited to their production yams and ginger. Plant out coffee.

KITCHEN GARDEN.—Now is the time when the kitchen garden will richly repay all the labour bestowed upon it, for it is the month for sowing many kinds of vegetables. If the soil is not naturally rich, make it so by a liberal application of stable manure and compost. Manure for the garden during summer should be in the liquid form for preference. Failing a sufficient supply of these, artificials may be used with good results. Dig or plough the ground deeply, and afterwards keep the surface in good tilth about the crops. Water early in the morning or late in the evening, and in the latter case, stir the soil early next day to prevent caking. Mulching with straw, leaves, or litter will be of great benefit as the season becomes hotter. It is a good thing to apply a little salt to newly-dug beds. What the action of salt is, is not exactly known, but when it is applied as a top dressing it tends to check rank growth. A little is excellent for cabbages, and especially for asparagus, but too much renders the soil sterile, and causes hardpan to form. French or kidney beans may now be sown in all parts of the State. The Lima bean delights in the hottest weather. Sow the dwarf kinds in drills 3 ft. apart and 18 in. between the plants, and the climbing sorts 6 ft. each way. Sow Guada bean, providing a trellis for it to climb on later. Sow cucumbers, melons, marrows, and squash at once. If they are troubled by the red beetle, spray with Paris green or London purple. In cool districts, peas and even some beetroot may be sown. Set out egg plants in rows 4 ft. apart. Plant out tomatoes 3½ ft. each way, and train them to a single stem, either on stakes, trellis, or wire netting. Plant out rosellas. Sow mustard and cress, spinach, lettuce, vegetable marrows, custard marrows, parsnips, carrots, chicory, eschalots, cabbage, radishes, kohlrabi, &c. These will all prove satisfactory, provided the ground is well worked, kept clean, and that water, manure, and, where required, shade are provided.

Orchard Notes for September.

THE COASTAL DISTRICTS.

September is a busy month for the fruitgrowers in the coastal districts of this State, as the returns to be obtained from the orchards, vineyards, and plantations depend very largely on the trees, vines, and other fruits getting a good start now.

In the case of citrus orchards—especially in the Southern half of the State—it is certainly the most important month in the year, as the crop of fruit to be harvested during the following autumn and winter depends not only on the trees blossoming well but, what is of much more importance, that the blossoms mature properly and set a good crop of fruit.

This can only be brought about by keeping the trees healthy and in vigorous growth, as, if the trees are not in this condition, they do not possess the necessary strength to set their fruit, even though they may blossom profusely. The maintenance of the trees in a state of vigorous growth demands—first, that there is an adequate supply of moisture in the soil for the requirements of the tree; and, secondly, that there is an adequate supply of the essential plant-foods available in the soil.

With respect to the supply of moisture in the soil, this can only be secured by deep and systematic cultivation, excepting in seasons of good rainfall or where there is a supply of water for irrigation. As a rule, September is a more or less dry month, and when it is dry there is little chance of securing a good crop of fruit from a neglected orchard.

If the advice that was given in the Notes for August regarding the conservation of moisture in the soil has been carried out, all that is necessary is to keep the soil stirred frequently, so as to prevent the loss of moisture by surface evaporation. If the advice has been ignored, then no time should be lost, but the soil should be brought into a state of good tilth as quickly as possible.

Where there is a supply of water available for irrigation, the trees should receive a thorough soaking if they require it. Don't wait till the trees show signs of distress, but see that they are supplied with an adequate supply of moisture during the flowering and setting periods.

It is probable that one of the chief causes why navel oranges are frequently shy bearers in the coastal districts is that the trees, though they produce a heavy crop of blossoms, are unable to set their fruit, owing to a lack of sufficient moisture in the soil at that time, as during seasons when there is a good rainfall and the trees are in vigorous growth or where they are grown by irrigation, as a rule they bear much better crops. The importance of maintaining a good supply of moisture in the soil is thus recognised in the case of this particular variety of citrus fruit.

When the trees show the want of sufficient plant-food—a condition that is easily known by the colour of the foliage and their weakly growth—the orchard should be manured with a quick-acting, complete manure; such as a mixture of superphosphate, sulphate of ammonia, and sulphate of potash, the plant-foods in which are soluble in the water contained in the soil and are thus readily taken up by the feeding roots.

Although the above has been written mainly in respect to citrus orchards, it applies equally well to those in which other fruit trees are grown. Where the land has been prepared for bananas, planting should take place during the month. If the plantation is to be made on old land, then the soil should have been deeply ploughed and subsoiled and brought into a state of perfect tilth prior to planting. It should also receive a good dressing of a complete manure, so as to provide an ample supply of available plant-food. In the case of new land, which has, as a rule, been scrub that has been recently fallen and burnt off, the first operation is to dig the holes for the suckers at about 12 ft. apart each way. Good holes should be dug, and they should be deep enough to permit the top of the bulb or corm of the sucker to be 6 in. below the surface of the ground.

Take great care in the selection of the suckers, and see that they are free from beetle borers or other diseases.

As a precaution it is advisable to cut off all old roots and to dip the corms for two hours in a solution of corrosive sublimate, made by dissolving 1 oz. of this substance in 6 gallons of water.

In old banana plantations keep the ground well worked and free from weeds and remove all superfluous suckers.

Where necessary, manure—using a complete fertiliser rich in potash, nitrogen, and phosphoric acid, such as a mixture of meatworks manure and sulphate of potash, 4 of the former to 1 of the latter.

Pineapples can also be planted now. The ground should be thoroughly prepared—viz., brought into a state of perfect tilth to a depth of at least 1 ft.—more if possible—not scratched, as frequently happens; and when the soil requires feeding, it should be manured with a complete manure, which should, however, contain no superphosphate.

Old plantations should be kept in a good state of tilth and be manured with a complete fertiliser in which the phosphoric acid is in the form of bones, basic phosphate, or finely ground phosphatic rock, but on no account as superphosphate.

The pruning of custard apples should be carried out during the month, leaving the work, however, as late in the season as possible, as it is not advisable to encourage an early growth, which often means a production of infertile flowers. If the weather conditions are favourable, passion vines can also be pruned now, as if cut back hard they will make new growth that will bear an autumn crop of fruit instead of one ripening during the summer.

Grape vines will require careful attention from the time the buds start, and they should be regularly and systematically sprayed from then till the time the fruit is ready to colour with Bordeaux mixture, in order to prevent loss by downy mildew or anthracnose.

Where leaf-eating beetles, caterpillars, or other insects are present, the trees or plants on which they are feeding should be sprayed with arsenate of lead. All fruit-fly infested fruit must be gathered and destroyed and on no account be allowed to lie about on the ground, as, if the fly is allowed to breed unchecked at this time of the year, there is very little chance of keeping it in check later in the season.

THE GRANITE BELT, SOUTHERN AND CENTRAL TABLELANDS.

Where not already completed, the winter spraying with lime-sulphur should be finished as early in the month as possible. Black aphid should be fought wherever it makes its appearance by spraying with a tobacco wash, such as black-leaf forty, as if these very destructive insects are kept well in hand the young growth of flowers, leaves, wood, and fruit will have a chance to develop. Woolly aphid should also be systematically fought wherever present, as once the trees are in leaf it is much more difficult to treat.

The working over of undesirable varieties of fruit trees can be continued. The pruning of grape vines should be done during the month, delaying the work as long as it is safe to do so, as the later the vines are pruned the less chance of their young growth being killed by late frosts. Keep the orchards well worked and free from weeds of all kinds, as the latter not only deplete the soil of moisture but also act as a harbour for many serious pests, such as the Rutherglen bug.

Grape vines should be swabbed with the sulphuric acid solution mentioned in the Notes for August, when the buds begin to swell, and just before they burst, as a protection against black spot and downy mildew.

New vineyards can be set out, and, in order to destroy any fungus spores that may be attached to the cuttings, it is a good plan to dip them in Bordeaux mixture before planting. The land for vines should be well and deeply worked, and the cutting should be planted with one eye only out of the ground and one eye at or near the surface of the ground.

In the warmer parts which are suitable for the growth of citrus fruits, the land must be kept well cultivated, and if the trees need irrigating they should be given a good soaking, to be followed by cultivation as soon as the land will carry a horse without packing:

In these parts fruit-fly should be systematically fought, as it will probably make its appearance in late citrus fruits and loquats; and if this crop of flies is destroyed, there will be every chance of the early crops of plums, peaches, and apricots escaping without much loss.

ASTRONOMICAL DATA FOR QUEENSLAND.

TIMES COMPUTED BY D. EGLINTON, F.R.A.S.

TIMES OF SUNRISE AND SUNSET.

AT WARWICK.

1924.	JULY.		AUGUST.		SEPTEMBER	
	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.
1	6.46	5.6	6.35	5.21	6.8	5.36
2	6.46	5.6	6.34	5.22	6.7	5.37
3	6.46	5.6	6.33	5.23	6.6	5.37
4	6.46	5.6	6.32	5.24	6.4	5.38
5	6.46	5.7	6.31	5.21	6.3	5.38
6	6.46	5.7	6.31	5.24	6.2	5.39
7	6.46	5.7	6.31	5.24	6.0	5.39
8	6.46	5.8	6.30	5.24	5.59	5.40
9	6.45	5.8	6.29	5.25	5.58	5.40
10	6.45	5.9	6.29	5.25	5.57	5.41
11	6.45	5.10	6.28	5.26	5.56	5.42
12	6.44	5.11	6.27	5.27	5.54	5.43
13	6.44	5.12	6.26	5.28	5.53	5.44
14	6.43	5.12	6.25	5.29	5.52	5.44
15	6.43	5.12	6.25	5.29	5.51	5.44
16	6.43	5.12	6.24	5.29	5.50	5.44
17	6.43	5.13	6.23	5.30	5.49	5.45
18	6.43	5.13	6.22	5.30	5.48	5.45
19	6.43	5.13	6.21	5.30	5.47	5.45
20	6.42	5.14	6.20	5.31	5.46	5.45
21	6.42	5.14	6.19	5.31	5.45	5.46
22	6.42	5.14	6.18	5.31	5.44	5.46
23	6.42	5.15	6.17	5.32	5.43	5.46
24	6.41	5.15	6.16	5.32	5.42	5.46
25	6.41	5.16	6.15	5.33	5.41	5.47
26	6.40	5.17	6.14	5.33	5.39	5.47
27	6.40	5.17	6.13	5.34	5.38	5.48
28	6.39	5.18	6.12	5.35	5.36	5.48
29	6.38	5.18	6.11	5.35	5.35	5.49
30	6.37	5.19	6.10	5.36	5.34	5.50
31	6.36	5.20	6.9	5.36	...	...

Phases of the Moon, Occultations, &c.

The times stated are for Queensland, New South Wales, Victoria, and Tasmania, when "Summer" Time is not used.

2 July	☾ New Moon	3 35 p.m.
10 "	☾ First Quarter	7 46 a.m.
16 "	☾ Full Moon	9 49 p.m.
24 "	☾ Last Quarter	2 35 a.m.

Perigee 15th July, 8.6 a.m.

Apogee 27th July, 10.30 a.m.

Venus will be in inferior conjunction with the sun, that is between the earth and the sun, nearly in a straight line with the latter. On 1st July, 10 p.m., the moon being nearly new will be apparently in close proximity. On 3rd July, 11 p.m., the earth will be at its greatest distance from the sun. Mercury will be in superior conjunction with the sun, that is on the far side of its orbit at 4 a.m. on the 6th. Saturn will be in conjunction with the moon on the 10th, at 10.54 p.m., Saturn being about four times the diameter of the moon above it. Jupiter will be in conjunction with the moon, or about nine times the diameter above it near midnight on the 13th. On the 19th, 10.34 p.m., Mars will be in conjunction with the moon or about nine times its diameter above it.

1 Aug.	☾ New Moon	5 41 a.m.
8 "	☾ First Quarter	1 41 p.m.
15 "	☾ Full Moon	6 19 a.m.
22 "	☾ Last Quarter	7 10 p.m.
20 "	☾ New Moon	6 36 p.m.

Perigee 12th August, 5.54 a.m.

Apogee 24th August, 3.42 a.m.

There will be three eclipses this month. (1) A partial eclipse of the sun will not be observable in Queensland. It rises on the 1st and will be over at 7.4 a.m.; (2) a total eclipse of the moon between the hours of 5.31 and 7.9 a.m. on the 15th, visible in Queensland; (3) a partial eclipse of the sun on the 30th, commencing at 4.50 p.m., and continuing for more than two hours after sunset, but not visible in Australia.

Venus will be at its greatest brilliancy on the 7th; it will then become a morning star. The moon will pass below Jupiter on the 10th at 6 a.m. Mercury will be at its greatest elongation east of the sun on the 15th and will have become observable after sunset. The moon will pass Mars on the 16th, at 4.20 a.m. Mercury will be about 18 degrees (three times the length of the Southern Cross) to the south-east of Regulus on the 15th. On the 23rd, Mars will be in its best position for observation, being near its least distance from the earth and almost at its greatest brilliancy.

5 Sept.	☾ First Quarter	6 45 p.m.
13 "	☾ Full Moon	5 0 p.m.
21 "	☾ Last Quarter	1 35 p.m.
29 "	☾ New Moon	6 15 a.m.

Perigee 7th September, 5 p.m.

Apogee 20th September, 10.54 p.m.

On the 23rd, at 6 a.m., the sun will be crossing the celestial equator on its way southwards, and the equinox will occur, the sun setting due west on the 23rd and rising due east on the 24th. Between 1 and 2 o'clock on the afternoon of 25th September the apparent proximity, to the naked eye, of the moon and Venus should form an interesting spectacle about half-way between the sun and the western horizon. Mercury will be at its greatest elongation W (nearly 18 degrees, or three times the length of the Southern Cross) on the 27th, at 7 p.m. The planets Venus and Neptune will be apparently very close to one another (about twice the diameter of the moon) on the 30th.

For places west of Warwick and nearly in the same latitude, 28, degrees 12 minutes S., add 4 minutes for each degree of longitude. For example, at Inglewood, add 4 minutes to the times given above for Warwick; at Goondiwindi, add 8 minutes; at St. George, 14 minutes; at Cunnamulla, 25 minutes; at Thargomindah, 33 minutes; and at Oontoo, 43 minutes.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night; when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

[All the particulars on this page were computed for this Journal, and should not be reproduced without acknowledgment.]

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF JUNE, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING JUNE 1924 AND 1923, FOR COMPARISON.

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	June.	No. of Years' Records.	June, 1924.	June, 1923.		June.	No. of Years' Records.	June, 1924.	June, 1923.
<i>North Coast.</i>	In.		In.	In	<i>South Coast—continued:</i>	In.		In.	In
Atherton ...	1.51	23	0.89	0.65	Nambour ...	3.35	28	1.85	3.12
Cairns ...	2.82	42	2.37	1.36	Nanango ...	2.05	42	0.93	2.31
Cardwell ...	2.06	52	1.80	2.04	Rockhampton ...	2.11	37	3.68	3.91
Cooktown ...	2.00	48	3.37	0.37	Woodford ...	2.66	37	2.70	2.44
Herberton ...	1.00	37	0.43	0.96					
Ingham ...	2.42	32	1.20	2.24	<i>Darling Downs.</i>				
Innisfail ...	6.98	43	8.26	2.15	Dalby ...	1.71	54	1.52	2.21
Mossman ...	2.32	15	2.38	2.53	Emu Vale ...	1.46	28	1.25	1.84
Townsville ...	1.27	53	0.90	2.43	Jimbour ...	1.74	36	1.07	2.23
					Miles ...	1.95	39	0.24	2.79
<i>Central Coast.</i>					Stanthorpe ...	1.90	51	1.57	2.95
Ayr ...	1.35	37	1.63	3.93	Tewoomba ...	2.36	52	1.24	2.83
Bowen ...	1.60	53	1.84	2.36	Warwick ...	1.81	59	0.84	2.02
Charters Towers ...	1.31	42	0.21	1.77					
Mackay ...	2.74	53	1.77	5.27	<i>Maranoa.</i>				
Proserpine ...	3.62	21	1.78	3.33	Roma ...	1.74	50	0.25	2.70
St. Lawrence ...	2.46	53	1.53	3.61					
<i>South Coast.</i>					<i>State Farms, &c.</i>				
Biggenden ...	1.98	25	2.51	4.90	Bungewongorai ..	1.87	10	0.23	2.74
Bundaberg ...	2.73	41	0.79	4.10	Gatton College ...	1.75	25	2.83	2.37
Brisbane ...	2.67	73	4.80	2.66	Gindie ...	1.61	25	0.70	3.62
Childers ...	2.27	29	1.30	4.27	Hermitage ...	1.97	18	1.08	1.98
Crohamhurst ...	4.09	30	3.30	2.89	Kairi ...	1.32	10	...	1.32
Esk ...	2.05	37	3.14	2.53	Sugar Experiment Station, Mackay	2.42	27	1.55	5.25
Gayndah ...	1.89	53	1.14	3.39	Warren ...	1.94	10	3.52	2.68
Gympie ...	2.54	54	1.99	3.60					
Glasshouse Mts. ...	3.86	16	2.91	2.70					
Kilkivan ...	2.09	45	1.50	3.54					
Maryborough ...	2.84	53	1.35	4.39					

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for June, 1924, and for the same period of 1923, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND,
State Meteorologist.

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PART 3.

Event and Comment.

The Current Issue.

An account of the Brisbane Exhibition occupies, quite fitly, much space in this issue. Departmental activities at the Show are well described in text and picture. An interesting report from Mr. Edmund Jarvis on progress made in controlling the grub stage of the grey-back cane-beetle will be appreciated by canegrowers. Mr. Froggatt contributes a useful summary of his observations on the Banana Weevil Borer. In a reprinted article, Mendelism is simply and interestingly explained. Mr. Shelton adds some useful notes on his Show yard observations of stud pig types and breeds. Some notes on studies of fertility of sugar-cane flowers by Mr. Cottrell-Dormer add to our general knowledge, especially as there is a dearth of literature on the subject. Mr. Watson's observations on the causes of low cream tests are timely and will explain to the dairyman many little annoyances. The discovery of a new native host for fruit-fly larvæ is noted by Mr. White. Generally, the September Journal is a very readable number; the regular features contain much useful information and the issue is well illustrated, the Exhibition claiming most of the photographer's interest. Other Exhibition pictures have been reserved for the October number.

Cotton Picking and Pests.

In a Press communication the Minister for Agriculture and Stock (Hon. W. N. Gillies) observes that there appears to have been a certain amount of misunderstanding in respect to the Order which extended the cotton-picking season until the 15th September. It is desirable to point out that this was the last date on which cotton should be picked by growers, and that all cotton plants must be either uprooted or properly ratooned to near the surface of the ground and all stalks and débris burnt by the 30th September at the latest. This matter is especially brought to the attention of growers, for it is a most important one, because this year, on account of the mild winter, hibernating pests such as the Northern Peach Moth and the Pink Boll Worm are already beginning to emerge, and it is therefore essential in the best interests of the industry that as many as possible of these pests should be destroyed whilst they are still dormant in the bushes. If the destruction of cotton shrubs is further delayed there is a possibility that swarms of moths of these pests will cause damage early in the season.

The Melbourne Cotton Conferences.

Interviewed on his return from the Melbourne Cotton Conferences, the Minister for Agriculture (Hon. W. N. Gillies) stated that he was well satisfied with the work done at the two conferences. Among the more important matters dealt with were the consideration of the report of the Advisory Committee, which was set up at the Sydney Conference in May last, and the adoption of a number of its recommendations. The Ministerial Committee, said Mr. Gillies, decided to give this Advisory Committee permanent status, and it will continue to meet biennially. Among the recommendations considered was the question of the necessity for co-ordination in the production of similar types of cotton throughout Australia, and to this end the distribution of good seed through the several Departments of Agriculture; the establishment of cotton experimental stations in centres in the cotton-growing belt, with the recommendation that the fullest use be made of the present departmental officers. Estimates were submitted showing the probable total cost of these stations. After revision, the scheme generally was approved, and for this year a recommendation has been submitted to the Federal Government to subsidise the Melton Experiment Station, in the Callide Valley, to the extent of £1,300. The Commonwealth Government is also being asked to pay the whole of the cost and the necessary salary to secure the services of a competent mycologist for the whole of Australia, assuming that the Empire Cotton Corporation decides against giving the assistance asked of it in this and other directions. The questions of coping with pests and quarantine matters were also discussed.

Standard Grades.

Another very important matter, approved by both the Ministerial and General Conferences, was the adoption of the recommendation made by the Director of Cotton Culture (Mr. Evans) and the Queensland Cotton Specialist (Mr. Wells) of a schedule of standard grades and prices to be guaranteed for the coming season. Commenting on this decision of the conference, Mr. Gillies said that he would have no hesitation in recommending the Queensland Government to agree to the guarantee for the 1924-25 harvest on the lines of the schedule recommended, because the price and conditions as to grade were such as would encourage the growers, with the minimum of risk to the taxpayers. The idea in giving a premium for grade instead of staple—the latter, it should be noted, is not a condition of the guarantee—is because length of staple is largely a matter of the variety of seed and the season, whereas grade is largely a matter of cleanliness in picking, keeping the good qualities separate from the inferior, and careful handling generally in order to secure the premium offered.

Co-operative Control.

The other important matter, and, in Mr. Gillies's opinion, the most important matter dealt with, following on his statement that the Queensland Government had no intention of renewing the ginning agreement after its expiry in two years' time, was the offer made by the directors of the British-Australian Cotton Association to open negotiations at once with the growers' representatives with a view to the ultimate co-operative control of the ginning and marketing of cotton by the farmers themselves. Mr. Gillies did not suggest that a matter of this kind can be settled by a conference, no matter how representative it may be or what unanimity might prevail at such a conference, but he thought that the spirit displayed by the representatives of the Association, and the speeches made by Sir Owen Cox and Mr. Baillieu on behalf of that organisation, disclosed an honest wish to bring about a more satisfactory arrangement between those who are ginning and selling the cotton and those who are growing the raw material. With the authority of Cabinet, Mr. Gillies made it quite clear that the Government had no intention of renewing the present agreement unless the farmers, by a large majority, requested renewal. He also made it quite clear that the Queensland Government has no intention of entering into the business of cotton ginning.

Ratoon Cotton.

On the question of ratoon cotton, Mr. Gillies said that this subject was discussed at both conferences, and after he explained the recent decision of the Queensland Government, setting out the conditions under which Queensland is allowing the growth of ratoon, the chairman, Senator Pearce, expressed the opinion that, as his Government was not prepared to include ratoon in any guarantee, it was really a matter for each State to decide the conditions under which the growth of ratoon cotton would be permitted. There was a very general feeling at the conference that Australia should make a special effort to produce the best, and nothing should be permitted that would injure the good name of Australian cotton on the world's market. It was agreed that the grading approved of by the conference should be applied to ratoon cotton as well as annual, but there would be no guarantee as to price. Discussing the matter privately with the Prime Minister (Right Hon. S. M. Bruce), Mr. Gillies said that time alone will tell whether the Queensland Government was right in its decision a year ago to impose an embargo, or the decision a few weeks ago, after twelve months' experience, to relax the restrictions on ratoon cotton.

Bureau of Sugar Experiment Stations.

FIELD REPORTS.

The Northern Field Assistant, Mr. E. H. Osborn, reports under date, 19th August, 1924:—

LOWER BURDEKIN.

Inkerman.

The adjacent township to the mill (Home Hill) has made wonderful strides during the past few years and may now be termed a very important sugar centre. How the township has grown may be seen from local school figures, which show that the average daily attendance for the year at the local school for 1913 was 32.8 pupils. In 1923 it had grown to 230.8, with a further steady increase for the present year.

For the week ending 19th July a total of 5,820 tons had been treated at the mill, and harvesting generally seemed very successful. Next year's prospects are distinctly good, for the strike of young cane was excellent over a large acreage. Cultivation methods have improved in the area, and good results are encouraging the growers to try for the best returns possible.

Among farms visited was that of Mr. F. G. Woods. Here was seen some excellent E.K.28, showing good length of cane and fair stools. Some very fine Q.855 was here too, but was inclined to be pithy. Further up the river at Mr. S. W. Gibson's, some twelve months' old plant Q.813 was cutting at the rate of 50 tons per acre, but the density was low, probably on account of the richness of the soil. In 1922 this cane gave a yield of about 60 tons per acre, and carried a very high density, while first ratoons returned in the vicinity of 40 tons per acre. Upon the same farm there is also a magnificent crop of N.G.24B (Green Goru) first ratoons, that should cut 35 tons per acre. Although this land is of good type it has been kept up to standard by the use of lime and green manure, in which Mr. Gibson is a firm believer.

All along the river frontage may be seen heavy cane crops, but around the Frederick's field area they are upon the light side. This is to be accounted for by their not getting the full benefit of irrigation earlier. Generally, this particular part of the Burdekin shows great promise from a sugar-producing point of view; and the growers who have hung on for so long under adverse conditions certainly deserve every benefit that they may get.

In last month's Ayr notes I omitted to mention that some very fine varieties of cane were seen at Mr. B. Crees, Kalamia Farm. They were E.K.28, H.146, H.Q.458, and H.109. The two former canes looked very well, but H.146 was inclined to be pithy. H.Q.458 and H.109 were very good and healthy looking. Mr. Crees has some 7 acres of E.K.28 planted out, and has had a very good strike. At Cameron and Irving's some splendid N.G.24A and N.G.24 (Goru) second ratoons looked a picture, whilst some eleven months' old plant Badila shows remarkable growth, probably averaging a 45-ton crop.

Invicta (Giru).

This area was visited during the last week in July, the conditions then being rather better than upon previous occasions. The increased number of irrigation plants driven by tractors is most noticeable. For instance, up to last year only four plants were in operation; at present there are thirty-three. Much old land has been planted, and there is also a considerable acreage of new for next year. The strike generally is very good.

Among those noticed particularly were areas of Messrs. J. Humprey's 20 acres of Badila, R. Walton's 20 acres of H.Q.426, and Poyser and McCrae's 7 acres of mixed cane. All these blocks look very healthy and free from weeds. Messrs. Humprey and Poyser and McCrae have each planted out a few lines of E.K.28, to test local conditions.

Diseases.—Two diseases most in evidence upon the Burdekin are Top Rot and Leaf Stripe. The former was noticed far more upon the Home Hill or Inkerman side of the river than upon the Ayr side, and is most prevalent in Badila. As for Leaf Stripe, it is far more noticeable in B.208 than any other cane, although occasionally Goru seems to suffer, especially in ratoons and when growing in close proximity to B.208. In one farm the first ratoons of B.208 were very bad, but

three rows of Q.908 separating this cane from N.G.24 (Goru) were quite free from the disease, whilst several stools of the latter (also first ratoons) were showing strong signs of the disease. If the practice of always ploughing out plant crops showing signs of this disease were carried out, it would greatly minimise the risk of infection. It must be remembered that the B.208 cane is not now grown upon the Herbert River through its great susceptibility to disease.

Pests.

Grubs.—Very slight damage has been caused by this pest this year, practically the only places affected being in the vicinity of Plantation Creek.

Moth Borers and White Ants.—Widely distributed damage was observed throughout the area. White ants are still causing some trouble, principally in parts of the Kalamia area, and an officer from this Department was carrying out some experiments in connection with the pest.

General.—The Lower Burdekin Pastoral and Agricultural Show was held early in the month, and was a pronounced success. Cane exhibits were good, but neither in quality nor quantity were they up to the high standard that generally characterises exhibits in the local show. No cane exhibits were received from either Inkerman or Invieta, where some excellent exhibits could have been obtained. It is hoped that next year's cane exhibit will be what it should be—one of the very best in North Queensland.

Innisfail.

This rich canegrowing area was visited early in August, when all the local mills were in operation. In consequence, the town of Innisfail was very busy. This centre is growing rapidly. With the advent of the North Coast Line this area should be one of the most widely known cane areas in North Queensland, for the true tropical conditions prevail here.

Goondi.

This mill was rapidly making a gap in the record crop that the manager expects to harvest. Up to date the cane was keeping well up to the estimate, but the supply being slightly upon the smaller side prevented the mill showing really what can be done under best conditions. Arrowing was fairly prevalent, more especially in 7R.428 (Pompey), of which a fairly large area is now under and going under. This cane is certainly good for moderate to poor land, giving a heavy tonnage per acre for such lands. Very little early planting for 1925 has been carried out, due, of course, to the continuous wet during early planting time. Several crops of Badila (young plant) were, however, seen upon the volcanic soil, one of the best being a 30-acre paddock upon Mr. R. Graham's Mindoo Farm. This looks wonderfully healthy and should make a heavy crop. Another good block was at Mr. McRobbie's place upon the South Johnstone road.

The Director of the Bureau of Sugar Experiment Stations (Mr. H. T. Easterby) has received a report from Mr. W. Cottrell Dormer, under date 19th August, 1924, who is at present investigating pests and diseases in sugar-cane districts:—

Districts surveyed:—South Johnstone, Banyan, Mourilyan, and Goondi. Upwards of seventy-six farms were visited. On the whole these districts were found to be very free from pests and diseases of sugar-cane; that is to say, that though these pests and diseases are fairly well distributed, it was only in a few well-defined localities that they were doing appreciable damage.

DISEASES.

Leaf Scald.

This disease was found present in all the districts visited. It is most prevalent in the South Johnstone and least at Goondi, where it was only noticed in a few stools of Badila close to the mill on the western side. Similarly at Banyan the infection is but slight. At Mourilyan it was found in two widely separated localities—the Plantation Estate and the Moresby. In the South Johnstone district, however, it was found in almost every locality visited, though the disease has nowhere reached epidemic proportions. The localities most affected are the old lands close to the mill and the whole of the Japoon area. In the latter district the disease was observed in all its outwardly visible stages—from the single light yellow streak running through the leaf and down the leaf sheath to its base to the complete etiolation of the leaves, cankering of the stick, and death of the stool. It is high

time that growers in this and other districts realised the danger of perpetuating such a virulent disease and used more care in the selection of their seed. Crops in which the disease is found present should, if possible, be discarded for seed purposes, even where only one or two stools are found to be diseased. Where difficulty is had in obtaining other seed, fortnightly or tri-weekly visits should be made to the selected block, and all stools showing suspicious leaf marking of any kind destroyed. In a block of varieties showing Leaf Scald at Japoon, Pompei was most seriously affected.

Leaf Stripe.

Very little of this disease is showing up at the present time. In fact it was noticed only in three stools of Badila on two adjacent farms, near the South Johnstone mill, on the eastern side of the river. Incidentally, it is interesting to note that several small blocks of the variety B.208 were examined in the Mourilyan and South Johnstone areas and found quite free from all visual symptoms of the malady.

Rust (*puccinia (Uromyces) Kuhnii*).

True rust was found more or less prevalent throughout the districts visited. On the whole the damage being done by it is inappreciable, though in the Mourilyan area, where most of it was seen, some stunted fields of Clark's Seedling were found very badly infected by it, every particle or fully unfolded leaf showing the characteristic markings. These latter consist of short orange to dark-brown longitudinal streaks. The length of these streaks vary in different varieties. In Clark's Seedling each individual streak seldom exceeds $\frac{1}{2}$ inch in length. If these streaks are examined closely they are found to be wounds in the outer skin of the leaf and to be far more numerous on the under side than on the upper side. The orange-coloured wounds are the younger ones, and it is found that the colour is due to the presence of hundreds of very minute particles which are the young spores or germs of the fungus parasite which causes the disease. A gentle rub of the finger removes these spores in the form of an orange-coloured dust. The wound is simply a bursting of the outer skin of the leaf and is caused by the swelling of these tiny spores, as they gradually attain maturity, since they are first formed within by the parasite. When fully mature they are grey in colour and are not so easily seen. They are then quite loose and ready to be transported to other leaves or stools by the countless scores of insects—flies, leaf-hoppers, beetles, wasps, bees, and bugs which dwell in our canefields. Healthy and vigorous canes are able to resist the germination of these spores, at least on their younger leaves, but the weaker stools readily succumb. Crops showing much rust should naturally not be used for seed, as such cane is of low vitality and possesses little or no power of disease-resistance.

Other Diseases.

One noticeable feature, as has already been pointed out by Mr. Osborn and others from time to time, is the great number of thin, red, or pink sticks to be seen in otherwise healthy crops of Badila in every district. It is probably a question of the combined action of soil toxins and root-fungi. There is no doubt that if the total loss sustained could be estimated the figures would be very great. Top Rot appears to have done but little damage in these parts; a small field of Badila in the Garadunga district was appreciably affected, but nowhere else was the disease found doing noticeable damage. Red Rot was found represented at Daradgee, but only one stick of cane showed the disease; it had doubtlessly been originally brought about by insect attack. One farmer at El Arish complained of obtaining poor strikes at times, because on such occasions the sets decayed before they were able to germinate. In such cases it would be well to soak supplies in Bordeaux wash before planting.

INSECT PESTS.

Grubs.

Serious loss has been sustained in certain localities owing to the ravages of the ubiquitous grey-back cane-grub. Foremost amongst these is Japoon, where a tract of fine light alluvial country about 6 miles in length has received more than its usual quota of damage. The grubs are still in evidence, though this is considered by local growers as being very late in the year for grub infestations. Some farms have as much as from 20 to 40 acres destroyed, the stools for the most part being entirely devoid of roots and having toppled over. The mill authorities are doing their utmost to cope with the situation by harvesting grub-eaten cane first wherever this is possible, in which case densities reaching over 16 c.e.s. are not unusual which compensates a great deal for loss in tonnage. This grub-infested area lies in a valley drained by the Liverpool Creek. The mountains on both sides and the creek banks

support scrub timber which contains many trees favoured by the grey-back beetles in their aerial life, while the soils of the canefields are loose and easy for grubs to work in—this is indeed an ideal home for cane-grubs. Two other localities where grubs have made their presence severely felt are Nerada and Daradgee, the damage having been done mostly on the red soil ridges lying fairly close to unfelled scrub lands. In all these cases the soil should prove quite suitable for fumigation. Odd stools showing grub damage were found here and there throughout the various districts, including the Soldiers' Settlement and the Tully.

Other species of less importance were found as follows:—*Dasygnathus australis-dejeani*, a few in their third stage at El Arish and at Mourilyan, *Lepidiota rothci* at Liverpool Creek, *Lepidiota frenchi* common in parts of Mourilyan, *Heteronyx sollicitus* (?) at Mourilyan. Another grub found fairly plentifully on one farm near Mourilyan Mill was a small Anoplognathid whose identity is unknown to me, but which will probably prove to be *A. mastersi*, the small green metallic Christmas beetle; they were found mostly in their cells at a depth of 8 inches or 9 inches preparing to pupate.

Beetle-borers and Tachinid Flies.

The borer is doing considerable damage at Japoon, Liverpool Creek, and parts of Daradgee. Other localities are also affected but to no very great extent. It is pleasing to note that the Tachinid fly parasite was found well established both at Japoon and at the South Johnstone Experiment Station, where flies have been liberated from time to time by the Meringa Laboratory. They have previously been located by Mr. Bates at Silkwood, where they were liberated some two years back. There is every reason to believe that the flies will spread throughout the South Johnstone district during the next few years.

Minor Insect Pests.

Besides the customary tribe of Leaf-hoppers, Linear Bugs, Leaf Miners, Bud Moths, &c., which are always so numerous wherever Badila is grown, the following minor pests were observed:—Wire worms and white ants (*Termes*) doing very slight damage to cane sets in Liverpool Creek and other localities; the Army Worm, seen at Liverpool Creek in small numbers; and *Melanitis leda*, of which butterfly a few specimens were seen flying about in canefields in different parts.

The Southern Field Assistant, Mr. J. C. Murray, reports under date, 18th August, 1924:—

Carmilla.

Although this area has been settled for a number of years, it is only since the tramline has gone through that cane has been planted extensively. The agricultural land is fairly typical of that which prevails along the flats of the creeks flowing east of the Dividing Range, having originally been covered with jungle and forest. Growers are all producing good crops, and cultivation and settlement are still extending, affording a good illustration of how people will go on the land if they only get, so to speak, a fighting chance.

The farms here, with a few exceptions, embrace both "jungle" and forest land. What is meant by the former term is that land which has been covered by those heavy brilliant green jungles, replete with beautiful trees and flowers that cover a vast acreage of Queensland soil, and which are wrongly given the rather mean term "scrubs." The forest land is back from the creek, and while of good texture and depth, is deficient in humus. The farmers on this class of land are advised to grow and plough under as much green manure as possible. This forest soil shows an acid reaction, and in conjunction with green manuring would be benefited by an application of about 40 cwt. of pulverised limestone per acre. Samples of typical soils were taken for analyses.

Farmers are fortunate in this locality in that they are not troubled a great deal by the grub pest. Bacterial agencies are in evidence to a limited extent, gumming being noticeable in the Badila. However, there is nothing serious. Growers are again reminded that in order to maintain the present condition, they should be careful in plant selection.

Cane varieties that grow well here are M.1900 Seedling, N.G.15, M.189, and D.1135. The first two canes make excellent growth, but with regard to M.1900 Seedling, the farmers are advised, if they desire to be successful with the ratoons, not to cut too early.

Koumala.

This is also a recently opened district. A light tramline has been constructed by the Plane Creek mill, and prospects at present look bright. Koumala is suited for closer settlement, as the land is arable and well watered. Other products, such as fruit and vegetables, particularly the tomato, do well here. Tobacco is another product that should pay the settlers to grow when the industry becomes stabilised.

There is a considerable acreage of heavy black forest soil in this district, of which the settlers are doubtful regarding its suitability as an agricultural proposition. They may be assured that this soil will give excellent results if it is ploughed at the right time and kept well drained. M.1900 Seedling gives a good tonnage and density in this class of land. Other crops that have been noticed growing on similar soil are potatoes, pumpkins, and cabbages.

There are a number of settlers in this locality from Great Britain. They are getting on well, and are satisfied with the new life. Mr. Innis, of Plane Creek Mill, takes an active interest in land settlement and gives settlers much valuable assistance. It is probable that if the established citizens of North Queensland took a more active interest in land settlement than they do, especially those that have agricultural land available, and made themselves responsible for a number of new settlers, the immigration problem would be on its way towards being solved. It is a matter of the utmost urgency at present that Queensland be populated, both with people on the land and people in secondary industries for which such a fine field exists.

Bundaberg.

Cutting is in full swing. The density of the cane is fair and rising as the season advances. Farmers not engaged in harvesting are planting. The tractor is coming more into general use, being used for drawing the planter as well as the plough. A good man on a tractor hauling two discs may plough 3 acres a day. At Oakwood the best varieties of canes are Q.813, M.1900 Seedling, M.189, E.K.1, E.K.28, D.1135, and 7R.428 (Pompey). The latter, though not planted extensively, shows promise of being a variety worth while. It is an excellent ratooner, and grows a good stool and heavy stick on a moderate soil.

On the Lovers' Walk area the cane has made good growth, and the farmers are satisfied they will get a payable return. Good results have been obtained by fertilising with sulphate of potash, one grower getting marked results by applying 3 cwt. per acre at planting on a block of D.1135. Farmers in this area have trouble with the partially sterile pockets that occur in their fields. These patches are probably caused by the formation of the sub-strata, where the pockets occur the top-soil is shallow and deep on the edges. It would take a number of years to produce fertility, but when ploughing, if a farmer on coming to these were to plough as deeply as possible each time, he would eventually produce a foot of fertile soil. Varieties showing well are—Shahjahanpur No. 10, E.K.28, E.K.2, Q.1121, H.227, Q.813, H.Q.285, and M.1900. Growers are advised to extend the planting of H.227, as it shows a considerable resistance to frost. No disease is in evidence beyond a minor distribution of fungoid and insect parasite attack, which is always present in the canefields.

Settlement is progressing along the main trunk line towards the Kolan River. Around Maida Vale Station there is a fair acreage of land suitable for agriculture, and which has not yet been broken up. Farmers who are established and growing cane have good crops to harvest. From experience of soils similar to these, bonedust is probably the fertiliser that will give results here. Green manures are also essential, as the soil is light and deficient in humus. Cane varieties thriving are H.Q.285, H.Q.77, Q.813, E.K.28, 1900 Seedling, and D.1135. Growers are advised to be careful with H.Q.77, as at times this variety shows a predisposition to disease.

Gin Gin.

At Fairyhills farmers are taking off good crops. They are slightly handicapped in harvesting by the hilly nature of the land and haulage. The soil is of a good quality, however, and there is a local source of lime if at any time growers require to lime. Liming, however, is not yet necessary. Green manuring would improve the present output. The soil is deficient in humus, and erosion would be minimised by the binding effect of green crops ploughed under.

The variety giving the best results is Rappoe Seedling. This cane is heavy and stooling well, with an erect growth. It is not generally high in sugar content, and is susceptible to gumming disease. Growers here are satisfied with this variety, however, and there is no reason to suppose that it will develop disease if careful selection is observed.

At Wallaville the season is in full swing. These fertile river flats are producing good crops. Frost has done small damage. As mentioned in previous reports,

these areas are admirably suited for irrigation. They also require constant cultivation to ensure a crop. On land of this description it is best to endeavour to grow canes that are erect in manner of growth so that intensive cultivation may continue throughout the season. Varieties cutting well are H.Q.285, Shahjahanpur No. 10, N.G.20, and D.1135. The first-named is making a particularly good showing as a ratoon crop. It should cut 30 tons per acre.

The reaction of this soil is slightly acid. Lime to the extent of 30 cwt. of pulverised limestone per acre would be beneficial. Growers are recommended, before fertilising, to submit samples of soil to the Director of Sugar Experiment Stations for analyses, or determine by a local experiment the value of mixtures on the market. These are good farms, and the owners should be getting more off them than they are.

CANE PEST COMBAT AND CONTROL.

The Director of the Bureau of Sugar Experiment Stations (Mr. H. T. Easterby) has received from the Entomologist at Meringa, Mr. E. Jarvis, the following report:—

I have to submit the following Progress Report dealing with the control of the Grub Stage of our Grey-back Cane-beetle (*Lepidoderma albobirtum* Waterh.).

In a previous report (May to June, 1923) the results of certain experiments carried out at Meringa, and on the Greenhills Estate with para-dichlor. proved highly satisfactory (see "Queensland Agricultural Journal," Vol. XX., p. 15); but with a view to obtaining further data in this connection, fifteen additional experiment plots were laid out during December to January last at Woree, Highleigh, Freshwater, Saw Mill Pocket, Aloomba, Meringa, and Hambleton.

The cane treated embraced both plant and ratoon crops of Badila, D.1135, and Clark's Seedling; my object being to test the action of this fumigant not only on Scarabæid grubs, but also on the rooting system and ultimate growth of the stools.

Doses varying from one-sixteenth to one-quarter ounce were buried at an average depth of $4\frac{1}{2}$ inches, injections being made from 12 to 18 inches apart and about 6 inches from the centre of stools.

Conclusive Proof of the Efficiency of Para-dichlor. as a Fumigant for Cane Grubs.

The Woree Experiment Plot.

The cane on grub-infested areas commenced to turn yellow and fall over towards the end of March last, such damage, however, not being widely distributed but occurring for the most part in large patches of varying extent.

At this time the plot of D.1135 treated with para-dichlor. at Woree on 18th December (August planting) could be plainly seen from a hillside more than a quarter of a mile distant, standing out as a dark green strip amongst the surrounding yellowing cane.

Naturally, this contrast became more noticeable as the season advanced and additional grub-eaten stools on the check plot collapsed and fell over.

When visited by the writer on 17th June practically all untreated stools coming within the grubby area were seen lying on the ground, while those on the fumigated plot (a strip 272 feet long by 20 feet wide) presented an unbroken dark green wall of cane about 8 feet 6 inches high. This was best observed from among the prostrate stools on the north-west check plot, which, being mostly down and no higher than one's knees, permitted a side view of the treated strip.

A splendid demonstration of the effectiveness of such fumigation occurred at the north-west end of the plot where grubs had destroyed the cane all around this portion, the injury coming butt up against the treated stools, which had remained untouched and of a normal green colour.

Freshwater Experiment Plot.

This plot of Badila—consisting of one-tenth acre—late July planting—was injected on 30th January, two rows 3 chains long receiving $\frac{1}{2}$ oz. and three rows $\frac{1}{4}$ oz. doses of para-dichlor.

The soil was inclined to be stony, and at the time of injecting was moist and in good condition, while the cane was then well out of hand.

When visited on 2nd July (about five months later) the treated plot was found unaffected by grubs, which, however, had severely damaged check ratoon cane on the southern side.

The stools on the northern check plot were also more or less grub-eaten, while those at the eastern side, which had been badly attacked, had all gone over. At this point, where the fallen cane stopped short against the treated strip, the contrast was most remarkable, affording conclusive proof of the efficiency of para-dichlor. as a grub destroyer.

This plot was doubly interesting from the fact of its having shown that $\frac{1}{2}$ oz. doses were sufficient to kill the grubs, there being no perceptible difference between rows treated with $\frac{1}{2}$ oz. and those receiving double that amount.

Aloomba Experiment Plot.

This consisted of one-eighth of an acre of Clark's Seedling which was injected 29th January, the cane at that time being about 5 feet high. One-third of this area was given $\frac{1}{2}$ oz. and the remainder $\frac{3}{4}$ oz. injections. Although grubs did not occur in sufficient numbers to kill the cane, their whereabouts were revealed during the dry weather experienced in April and May. At that time the cane growing on check plots adjoining each side of the treated strip was observed to turn yellow and manifest decided evidence of grub injury.

Such infestation, although for the most part confined to a large patch at the western end, was enough to show the contrast between treated and check stools, the former of which remained perfectly green and unaffected by grubs throughout the season, while stools forming the check areas on either side of the treated plot, although kept alive during the remainder of the season by intermittent showers, failed to regain their normal colour.

In each of the abovementioned districts the experiment plots alluded to yielded unmistakable evidence of a positive nature regarding the insecticidal action of para-dichlor. on root-eating cane grubs, and had the season been a dry one accompanied by greater infestation, all the check cane surrounding the plot at Woree, and possibly that at Freshwater, would have turned brown and died, leaving the fumigated areas standing alone amidst the general ruin.

Fumigation With Para-dichlor. Does Not Injure the Cane.

It was interesting to note that in canefields free from grub attack the stools on treated and check plots were of uniform height, colour, and general appearance, proving conclusively that such fumigation had not in any way affected normal development of the stools.

On a plot of D.1135 at Highleigh, indeed, the grower, Mr. J. Cannon, was of opinion that although no decided evidence of grub injury could be noticed either on the treated or check plots, the cane on the former appeared to be slightly higher than that of the untreated areas.

Upon comparing the length of the sticks from these plots while they lay in the field after cutting, this difference in tonnage was quite appreciable.

Unless growth of some of these stools outside the treated area had, in reality, been slightly checked by grubs, we have no alternative but to assume that para-dichlor., like carbon bisulphide, may stimulate growth of the cane by destroying certain injurious soil bacteria.

In view of the fact that an application of the former fumigant is beneficial throughout a period about forty times as long as that occupied by an injection of carbon bisulphide, such an assumption is not at all unreasonable.

Cost of Para-dichlor. and Its Application.

During 1922 to 1923 the price of this fumigant in its crude and refined forms has varied from about £1 18s. to £5 10s. per cwt., the latest quotation from Sydney (June, 1924) being £1 19s.

The cost of material for treating an acre with $\frac{1}{2}$ -oz. injections of para-dichlor., placed 18 inches apart on each side of the cane rows, would not exceed £2, while the same dose injected at intervals of 12 inches apart would cost £3 per acre.

With the machine already adapted by Massey-Harris under my direction for putting para-dichlor. into the ground (see "Australian Sugar Journal," Vol. XV., p. 708, March, 1924), one man and a horse could fumigate from 3 to 4 acres a day, so that the cost of application should not amount to more than about 7s. 6d. per acre.

Uses of Para-dichlor.

In all probability para-dichlor. will ultimately come into general favour as a fumigant for destroying root-eating grubs of various economic insects, and at the present time is being largely used for fighting beetles, &c., attacking stored products, larvæ of moth borers, white ants in houses, &c., &c.

The following advantages of this fumigant as a controlling factor against subterranean insects may be very briefly enumerated:—

1. Its influence continues operative during a prolonged period.
2. It is not objectionable to handle; is non-inflammable; and not poisonous.
3. Cost of labour for application does not exceed 7s. 6d. per acre.
4. It is insoluble in water.

Para-dichlor. is marketed in the form of irregular small lumps, nodules, or granules of variable size, resembling crystals of sodium carbonate, or hyposulphite, and of a colour ranging from whitish or light yellowish-grey to pale greenish-yellow.

The crystals, although insoluble in water, dissolve very readily in chloroform, carbon bisulphide, ether, &c. A liquid form (ortho-dichlorobenzene) is obtainable at a cheaper rate than the para-compound, but, unfortunately, has the disadvantage of evaporating completely about a couple of days after application.

Similarly, when nodules of para-dichlor. are dissolved in such liquid media, which is then injected into the ground, any recrystallisation of the chemical taking place would necessarily consist only of exceedingly minute crystals which, being separated one from another amongst the soil particles, would evaporate completely in a few hours.

Thus it becomes advantageous to inject the para-dichlor. form, and also to employ large nodules, the fumes from which will be operative during a period of from six to eight weeks.

In plots fumigated last season with the "Jarvis Injector" the para-dichlor. used in these experiments was first passed through a sieve having a mesh of three-eighths of an inch.

The insolubility of these crystalline nodules in water is, of course, a great advantage, since during wet weather evaporation practically ceases, becoming operative again as soon as excess of moisture has drained away.

When to Apply Para-dichlor.

If injected during the wet season when grubs have started to damage the crop, the chances are that on low-lying situations or areas supporting sufficient growth of sticks to overshadow the ground between the rows, such land may remain closed against passage of the fumes until the end of the season, in which case an erroneous impression may get around to the effect that para-dichlor. will not kill cane grubs.

As a matter of fact, this actually happened during the 1922-1923 season on a piece of land belonging to Mr. Painter, at Woree, which was injected on 19th March when grubs were in the third instar and had commenced to damage the cane. Injection was in this case followed almost at once by a precipitation of 14 in. of rain during the next eleven days. The cane on the treated plots being over one's head kept the ground from drying, and when examined about three weeks later it was found that no perceptible evaporation of the para-dichlor. had taken place, and most of the grubs were alive.

About two months after injection, however, when excess of moisture had commenced to drain away, another examination (21st May) revealed a mortality of about 50 per cent. of the grubs still present; ten of these treated stools when dug up yielding collectively twenty-three living and twenty-four dead grubs of *albohirtum*.

During the same season the plots at Meringa, which had been injected about seven weeks earlier than those at Woree, afforded unmistakable proof of the efficiency of para-dichlor. as a fumigant for cane grubs. (See "Queensland Agricultural Journal," Vol. XX., p. 376, November, 1923.)

The proper time, then, to apply this fumigant is during December and January, commencing directly grey-back cane beetles appear on the wing, which usually occurs some time in November.

During these two months the ground is generally in fit condition for such fumigation, and, moreover, one is able at this time of the year to get among the cane and work the ground without risk of damage to the young crop.

In addition to the influence exercised by soil porosity evaporation of this chemical is also affected by degrees of temperature. Our average shade heat during December and January is about 83 degrees Fahr., which combined with suitable soil conditions permits of very free evaporation of the fumes of para-dichlor.

During experimentation at Gordonvale in 1915 the writer observed that in dry weather $\frac{1}{2}$ -oz. doses injected in light volcanic soil at a depth of 7 in., and subjected to an average temperature of 69 degrees Fahr. lost nearly 50 per cent. in weight during a period of fifteen days, but did not quite disappear until the end of six weeks.

Soil under cane stools treated 5th March smelt strongly of para-dichlor. on 8th May—three weeks after complete evaporation of the crystals, from which we may assume that a limited area of such contaminated soil, comprising, say, a strip of land 1 ft. wide, would continue to be repellant against further invasion until the odour became least decided.

On open soils during dry summer weather $\frac{1}{2}$ -oz. injections are not likely to entirely evaporate in less than from five to six weeks, but seven to eight weeks may be taken as the period of evaporation for most soils during average climatic conditions.

When fully exposed to air and daylight, however, on my office table, I found that $\frac{1}{2}$ oz. of the crushed-up crystals took about fifteen days to completely evaporate, under an average shade temperature of 84 degrees Fahr.

How to Inject Para-dichlor.

This can be accomplished either by a hand injector or a machine, the latter mode being, of course, desirable when treating large areas. All of our experiment plots, excepting one at Kamma this season, have been fumigated with the "Jarvis Injector" which was designed to meet the need for treating small areas of soil with insecticides or fumigants in a dry crystalline form. This appliance, which is simple and inexpensive, would be very serviceable in orchards for fumigating fruit trees to destroy root-boring beetles, wire worms, &c.

The machine experimented with in this connection (alluded to under heading, "Cost of Para-dichlor. and its Application") does not actually inject, but buries uniform doses of the chemical at regular intervals along the rows of cane.

The fumes given off from these crystals are harmless to human beings and domestic animals, and being about five times heavier than the air, work downwards among the interstices between the soil particles. Injection, therefore, should be made about an inch above the level at which grubs are found to be working. Although the vapour as a whole naturally tends to sink in this way, a proportion of the fumes are also drawn towards the surface during the process of evaporation of moisture by the sun.

Growers should remember that para-dichlor. when acted upon by the air does not deliquesce, but very gradually volatilises, thus allowing the gas ample time in which to impregnate the entire strip of soil occupied by the main roots of the cane stools.

The crude and cheaper forms of this chemical are just as effective against cane grubs as the refined qualities. The crude form when opened up upon arrival here was found to be quite moist, and of a pale, greenish-yellow colour, while the fumes given off, in addition to possessing the usual characteristic pungency, emitted an odour somewhat resembling that of burnt sugar. Although this moisture soon evaporates, the sugary smell has still remained unaltered after a lapse of nearly two years.

Work with Para-dichlor. in America.

It is interesting to note that in 1915, while the present writer was conducting first experiments with para-dichlor. against cane grubs at Gordonvale Laboratory, it so chanced that control work was also being commenced at the same time with this chemical and other toxic gases by the Bureau of Entomology at Washington, in hopes of finding some means of combating larvae of the Peach Borer (*Egeria catrix*), an insect causing injury each year amounting to 6,000,000 dollars. As a result of these experiments, carried out during several seasons, Mr. E. B. Blakeslee clearly demonstrated that para-dichlor., when properly used was uniformly effective against the Peach Borer, and in a recent publication issued by the United States Department of Agriculture (Farmers' Bulletin No. 1246), he states as follows:—"There has now been accumulated a sufficient body of experience, based on large scale, commercial use, and further experiments by the Bureau and others, principally the New Jersey Experiment Station, to show that a practical economic method of control has been found for this heretofore invulnerable pest."

Reverting again to our own experiments with para-dichlor. we also are now in a position to announce that the worst insect enemy of the Queensland canegrower—the dreaded grey-back cockchafer (*Lepidoderma albobirtum* Waterh.)—has at last been dealt a severe blow, the economic significance of which will be far-reaching, and cannot fail to be ultimately realised by all who are aware of the tremendous annual loss to the sugar industry (amounting, it has been estimated, to hundreds of thousands of pounds sterling) caused by the ravages of this well-known cane beetle.

THE LOGAN CANE CROP.

The Director of Sugar Experiment Stations (Mr. H. T. Easterby) paid a brief visit to the Beenleigh territory recently. This area was looking particularly well, and it was surprising to see the large amount of English clover covering practically every paddock.

The cane crop this year is probably larger than at any time in the previous history of the Logan district, it being anticipated that the yield of cane will be 25,000 tons. Of this amount 16,000 tons will be crushed at Mr. Heck's Rocky Point Mill and the balance by the remaining mills.

The Rocky Point Mill, which is now a very fine sugar factory, capable of dealing with about 40,000 tons of cane, was also visited. Recently Mr. Heck has completed 7 miles of tramway, complete with loco. and rolling-stock. This will be of enormous advantage to the Pimpama Island and Norwell districts in the harvesting of their cane. An up-to-date laboratory has also been built and fitted out, and cane at this mill is now bought on an analytical basis.

Considerable improvement has also been made in the Alberton Mill, where new carrier gearing and rollers have been provided, while the engines have been put on new concrete beds. A set of triple effects has been brought from the Waterloo Mill and erected.

Altogether the Beenleigh district shows signs of considerable improvement from a sugar point of view. There are still a few old varieties, such as New Guinea 64 and Mavoe, which should be got rid of in favour of canes such as H.Q.285 and Q.813.

BANANA WEEVIL BORER.

By JOHN L. FROGGATT, B.Sc., Entomologist.

In consequence of numerous inquiries having been made on certain aspects of the Banana Weevil Borer problem, it is deemed advisable to make a brief summary of previously recorded observations, together with certain recommendations, in order that a considerable amount of information may be gathered into a readily accessible form.

The egg is laid in a small burrow in the plant, generally about ground level, and lies just beneath the surface. The opening made for the deposition of the egg is practically closed by the shrinking of the tissue immediately surrounding the orifice, thus forming what is virtually a sealed chamber. The grub emerges in about eight days, and begins to burrow into the plant, closing the tunnel behind itself with waste fibre and excreta. For a portion of its life it works through the outer portion of the bulb, not only devouring tissue but also damaging many root origins, causing them to decay. It also tunnels through the heart of the corm, where through its voracious appetite it reduces the food storage capacity of the plant. When full fed it works towards the surface of the corm, and comes to rest in the end of the tunnel, with a very thin partition separating it from the soil. The grub takes, on the average, about 45 days to mature. In about two days it changes to the chrysalis. This stage in the life cycle is a resting one, during which a complete change in the structure takes place to form the beetle. This occupies a period of seven to eight days. The full-grown weevil on emerging is light in colour and very soft, and remains quiescent for several days, during which time it becomes darker and hard, black being the colour of the mature insect.

Once the beetle leaves the plant it lives in the soil or any old decaying banana material on the ground or in the stools.

The beetles live for a very long time when food is obtainable continuously. From laboratory observations the period extends over sixteen to twenty-one months, during the greater part of which oviposition, though more active in the spring and autumn, is continuous. Without food in dry soil they die in less than one week, but when the soil is damp they may live for several months.

The vitality of the adult weevils is well illustrated by the fact that they will survive as much as twelve days' complete immersion in water.

They will be generally found in old rotting stems and butts that are super-saturated with the fluids from the decomposition of the tissues. As many as thirty-nine live beetles have been taken from one old butt in a stool, and more than 100 from an old rotting stem on the ground.

The study of the effect of poisons on the adults has received a considerable amount of close attention. Although much work yet remains to be done on this line of investigation, it may be here stated that the two most satisfactory poisons used to date are Paris green and powdered arsenite of soda, both used dry and mixed with flour as a diluent, the former in the proportions of 1 to 6, and the latter 1 to 3. The mixture is sprinkled over the freshly-cut surface of a piece of banana corm, which is laid in or just outside any stool in which infestation has been found to occur. Very favourable reports have been received from banana-growers who have used this poison mixture, stating that they have found it kills numbers of the beetles.

This method renders the system of "baiting" a practicable proposition, for the labour and time spent in examining non-poisoned baits and destroying the beetles found was in many cases prohibitive.

This work has been dealt with in greater detail in the article on Banana Weevil Borer in the "Queensland Agricultural Journal," May, 1924.

The very long life of the adults and the consequently lengthened period over which eggs may be laid render imperative the destruction of the beetles at as early an age as possible.

The dispersion of this pest may be brought about in one of three ways—

1. By transportation of suckers from an infested plantation. This is by far the greatest means of distribution. It is therefore to be most strongly recommended that care should be taken to plant suckers that come from a source free from the pest.

Where borer is present in a plantation suckers may be dug perfectly free from the pest; being left lying on the ground they act as baits for the beetles, and as a result some have eggs laid in them before they are carted away. Eggs may, of course, have been deposited in the plants while standing in the stool.

Should suckers be obtained from an infested source, the greatest care should be paid to the following precautions in order to minimise to the fullest extent possible the danger of removing infested plants:—

(a) No plant should be dug in any area that has been allowed to go out of cultivation, for the pest is always worse in such localities, as no measures have been taken to check it breeding.

(b) When dug the plant should have all trash, &c., removed, and the corm well pared, in order to cut away as far as practicable the portion in which eggs may be lying.

(c) As soon as this is done they should be put in a cart or slide (or, as a last resort, in a bag) to prevent their lying on the ground and acting as baits. When a load is ready it should be taken right out of the plantation. Under no consideration should the suckers be allowed to lie in the plantation overnight, as the beetles are essentially night prowlers.

(d) Whenever possible it is most strongly recommended that each load of suckers be taken to the new site for planting, but where storage is necessary this should be done at a distance from the plantation, and they should be then kept off the ground.

2. There is no doubt but that the beetles may, and will, crawl from an old area into a newer one as the supply of plant material dwindles. Therefore, a new plantation should not be laid out close alongside an old abandoned one in which the pest is present.

3. By flying. There is no doubt now but that under certain as yet undefined conditions the adult weevils do fly. The information received to date on this matter is extremely scanty, the authenticated cases of normal flight all occurring between December and March. As this is an extremely difficult matter to experiment on, any information on observations made by growers will be welcomed—time of year, time of day, climatic conditions, wind, and the lie of the country are all important considerations in this connection.

As has been emphasised on previous occasions, areas which have been abandoned or allowed to go out of cultivation constitute a decided menace not only to the plantations in the neighbourhood, forming centres in which the pest may breed unchecked, and from which it may spread, but also to the district generally, as constituting a site from which suckers may be obtained for the taking.

Not only do crawling and flight always constitute means of dispersion, but also the wash after rain down gullies or steep slopes may carry beetles or portions of infested plant material for a considerable distance.

Once again attention is, therefore, drawn to this matter, which, if an effective control of the pest is to be aimed at, must be taken in hand. The plants in these old areas must be wiped out, and those in any area, as it goes out of cultivation, must be rendered unsuitable as a breeding-ground or site for shelter for the pest.

Control methods must, therefore, aim at preventing the pest breeding as far as possible. With this object, all old butts and corms should be so chopped up and stems split in half that they will dry as quickly as possible; in that condition the fibre can be chipped in, and so retain the humus in the soil, or burnt. Such beetles as are present will then be forced to congregate in the vicinity of the stools.

To destroy the beetles in the soil, poison baits can be utilised, or untreated baits with subsequent hand collection and destruction of the weevils found. So far no effective treatment is known by which the plant can be protected from infestation, or by which the pest inside the plant can be destroyed.

It is hoped that facilities will be available in the near future to study both these aspects of the problem, so that data may be obtained from which conclusions may be drawn.

For the information of those to whom the Banana Weevil Borer is still a stranger, a note on how to keep a watch for it may prove useful. Old corms, stems, &c., being a favoured breeding site, and easy to cut into, take a grubber or other tool and chop into them. If present, the grub tunnels will be seen, and on these being followed up a fleshy, white, legless grub, about half an inch long, with a red head, should be found. The holes in cross section will be circular in outline. The adult may also be met with, and is slightly less than half an inch in length, hard, black in colour, with a slightly curved trunk in front of the head.

The liberation of the Histerid beetle, *Plaesus Javanus*, from Java, a known predator on the Banana Weevil Borer in its country of origin, is being continued in a small area adjacent to Brisbane. Although it is as yet too early to decide whether it has become established, several imagos of this beetle have been found alive two to three months after liberation.

MEDELISM SIMPLY EXPLAINED.*

By A. B. BRUCE, M.A., Dip. Agric. (Cantab.), Ministry of Agriculture, U.K.

An attempt will be made in this article to explain Mendelism in simple language. The use of technical terms is reduced to a minimum, and attention is concentrated on facts rather than on theory, though some reference to the latter is inevitable.

It is unfortunate that, in the hands of writers of text-books, Mendel's so-called "theory" assumes a mathematical aspect which terrifies the ordinary reader. The result is that there is still a general failure to recognise the practical bearing of many of the new facts discovered by Mendel and his successors. When I speak of facts, I deliberately exclude "theory." No scientific education is needed to recognise facts; the scientist frames a theory to explain facts and to enable him to predict new facts. Now the discoveries of Mendel, apart from his theories, lead irresistibly to one distinct conclusion of fact—viz., that a parent does not, as commonly believed, transmit to its offspring *something of all* its characters.

Inheritance and Transmission of "Blood."

This, in effect, means that we must no longer regard inheritance as transmission of "blood." We have been accustomed to speak of an animal as possessing half, quarter, or some other fraction of the blood of a progenitor. What the facts discovered by Mendel have taught us is that an animal (or a plant) is, as it were, a pack of cards and that inheritance is a shuffling of two packs of cards (one representing each parent) out of which a new pack is made up. As this new pack cannot contain all the cards of the two original packs, we see how it comes about that the offspring may, in some respects, differ from the parent.

Again, we may contrast the old and modern views of heredity by employing another image. On the older view, or theory, we may liken two parents to two glasses of wine. Suppose one contains red and the other white wine; if we mix the two glasses we get a glass of light red wine, and we know that if we pour out another glass of the mixture the red and white are still intermingled in the same proportion. This typifies the ordinary (and mistaken) view of inheritance; the "blood" has been mixed and remains mixed.

But let us suppose that instead of wine, we were to fill one glass with minute red beads and the other with minute colourless beads. When we mix the two, the

* In "The Farmer and Stock Breeder," 21st July, 1924.

mixture again looks reddish. But this mixture differs from the mixture of wines because the red and colourless constituents still remain separable. A fresh glass could be made up from the mixture, containing either all red or all colourless beads, and this is, in effect, Mendel's discovery. I must repeat that this is not "theory," not something imagined by a learned professor.

The Case of Andalusian Fowls.

The facts relating to the breeding of Andalusian fowls correspond exactly to our simile of the two glasses of beads. The blue (really speckled black and white) Andalusian can be produced by mating a wholly black with a wholly white fowl. The first generation is all blue, really mixed black and white, but the black and white of the two parents can be distinguished. If we now mate two "blue" Andalusians, nature sorts the "beads" for us; for among the offspring of this mating we shall find some birds wholly black and some wholly white. And more; if we now interbreed the wholly whites, the black does not reappear. The black "beads" have been poured off at it were: there will be no reversion to black. Again, there is no theory here. The experiment has been tried many hundreds of times, and always with the same result. In other words, the blood theory is opposed to practice. The first white bird in the above experiment on this theory has one-quarter black "blood." How, then, can we explain the fact that, however long we go on breeding such "extracted" whites together, no sign of reversion to black is ever found?

But we must clearly recognise that what we have found in Andalusian fowls does not necessarily apply even to other breeds of fowl, much less to other animals. For example, we know that if negro and white are mated together, the black skin, or other characters associated with the black, such as type of hair, cannot be bred out so easily. And this consideration brings us to the following. It cannot be assumed that all characters behave in inheritance like the black and white feathering of the Andalusian fowl. All we can say is that it has been proved as a fact by thousands of experiments (particularly in plants) that a very large number of characters do behave like the aforesaid black and white feathering. It must, however, be admitted that in regard, generally, to characters which are valuable economically, knowledge is still deficient. For example, we do not know with any certainty what is the exact mode of inheritance of the milk-yielding capacity of cattle. But this, at least, we do know. The only way in which we can finally clear up the laws of heredity is by studying progeny rather than pedigree. For it is clear that neither pedigree nor external appearance are safe guides if we wish to predict the nature of progeny. Returning to the Andalusian example, it may be pointed out that there is nothing in the appearance or pedigree of the "blue" bird to lead us to expect that its descendants will contain some white birds, or that these white birds will not revert to black or blue. Our knowledge as to what will certainly happen has been derived from experiments with the progeny.

To recapitulate, we see that in regard to inheritance an individual does not behave as an undivided whole. In many respects, though not in all, it behaves like a colony of many individuals. It is only by experiment and observation of progeny that we can discover what these separate colonies or "characters" are. If we must still speak of "blood," we may remember that blood is not a red fluid all through; it is a colourless fluid containing numberless little bodies—corpuscles; some of which—the so-called white corpuscles—are to all intents and purposes little animals leading a separate existence of their own. So it comes about that when two colonies (parents) fuse and produce a third (progeny), some of the individual characteristics of the parents may be dropped—that is, may disappear from the blood entirely. In short, as the modern geneticist expresses it, parental characteristics may segregate in the offspring. The first principle of Mendelism is "segregation" of "characters."

We have learned, then, to regard the parents of an individual animal or plant not as each a single entity, but rather as a conglomeration of diverse characters. We know, therefore, that progeny of a mating is in a great degree not a blend of the parents, but an assortment of characters, some derived from one parent, some from the other.

Reversion.

But, it may be said, reversion is also a fact; we know that a certain character possessed by one or both parents may disappear in the offspring for a time and yet reappear in a subsequent generation.

Another of Mendel's discoveries was that reversion is not a mysterious principle of nature beyond human control. In many cases (not in all) we now know why it occurs, and, what is more important, we can predict its occurrence with as great certainty

as an astronomer can predict the happening of an eclipse years before it occurs. (And, in passing, it may be noted that one of the distinguishing characteristics of scientific, as contrasted with ordinary, knowledge is this power of predicting, this accurate understanding of the working of nature's machine.)

Let us take an example of reversion from cattle breeding. We know that the first cross between a polled and a horned breed (say, between a Polled Angus and a Shorthorn) is hornless (rarely the cross has scurs, or rudimentary horns); and we know that if we breed crosses of this description together reversion to horns may occur. Let us return to the glass bead simile; let us think of the polled parent as the glass of red beads and of the horned animal as the glass of transparent beads. Now in the first cross the mixed beads are coloured; in fact, if we imagine the beads as very small, we shall not see the colourless beads at all; colour dominates want of colour. And now we can see how reversion may occur; for we can sort out a glass full of the colourless beads from the mixed beads of the first cross. And this is what nature does. When it has made up the new reverted horned animal it has sorted out the (as it were) horned beads from the mixture of horned and hornless beads. Further, we see that the new horned animal has no "polled" beads in its composition; the beads are all without colour. It follows that the progeny of this "extracted" horned beast (so long as no polled parent is introduced) will not revert to polledness.

Dominant and Recessive Characters.

We are now in a position to explain the terms "dominant" and "recessive," as used in Mendelian phraseology. These epithets are applied to a pair of contrasted characters such as hornlessness and "hornedness," of which the first is described as dominant and the latter as recessive because (just as the coloured dominate the transparent beads) when both are present in the same individual, the dominant only is apparent, while the other is recessive—recedes, as it were, to the germ cells. During the last twenty years, as a result of numberless trials with plants and animals, a great many such pairs of characters have been found, and, in consequence, precise predictions can be made as to the characters that will appear when certain matings are made. For example, in plants, colour and want of colour (white flowers) generally act as a dominant and recessive; in animals, too, colour is generally dominant to absence of colour; but as an illustration of the complexities of the subject, it may be noted that absence of colour is sometimes produced by a dominant something—probably some chemical substance, under which colour lies hid as it were. For example, it has been found that some individual sheep carry black wool "recessively," and when two such sheep are mated a black lamb may result. This somewhat exceptional case is mentioned in order to emphasise the fact that until trial has been made it is difficult to predict how a character will behave in inheritance.

The Theory of Mendelism.

And now some mention must be made of theory. When a scientist has observed a number of new facts, he proceeds to frame a "theory" which will explain them. The result is that theory often leads to practical results. (The whole of the results of "wireless" are the product of a "theory" of electricity propounded by the great physicist, Clerk Maxwell, fifty years ago in his laboratory at Cambridge.) The Mendelian theory is that when a pair of contrasted characters (Mendelians call them allelo-morphs, one of which may be non-apparent or "recessive") are present in an individual, a germ cell produced by that individual contains either one or other of these characters, never both. (In terms of our simile, this is the way Nature sorts the red from the transparent beads.) So that the contribution of one parent to the new individual, so far as any one character is concerned (always one-half), is of one kind; the other parent contributes also one of the pair of characters only, which may be either similar to that contributed by the other parent, or one of the alternative sort. Thus we see, returning to the beads again, that an individual child of the union of two individuals of the mixed bead type may, so far as that particular pair of characters is concerned, have any one of three alternative "make-ups," viz.: (1) two red beads; (2) one red and one transparent bead; and (3) two transparent beads. Only one conception remains to make a complete picture. We must imagine that an individual is made up of an immense number of beads of all colours (each colour corresponding to one character) as well as a large number of beads no colour; further, each pair of beads may go its own way in inheritance, or, in other words, each pair of Mendelian unitary characters behaves independently in inheritance, so that there may be almost an indefinite number of "make-ups" each containing a different assortment of each colour (as it were) of one or other of the three possibilities described above.

NEUTRALISER CHART FOR SODA BICARBONATE.

BASIS OF CHART:

1.49 oz. Soda Bicarb.

Neutralise 1 lb. Acid.

IN POUNDS AND OUNCES TO NEAREST OUNCE.

Compiled by
FREDERIC J. WATSON,
DAIRY INSTRUCTOR.

To Reduce		PER CENTUM OF ACID IN CREAM.																							To Reduce	
To 29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59	61	63	65	67	69	71	73	To 29			
To 27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59	61	63	65	67	69	71	To 27			
To 25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59	61	63	65	67	69	To 25			
Lbs. Cream 50	0 0	0 0	0 0	0 0	0 0	0 1	0 1	0 1	0 1	Soda Bicarbonate				0 2	0 2	0 2	0 2	0 2	0 3	0 3	0 3	0 3	Lbs. Cream 50			
										0 1	0 2	0 2	0 2	0 2	0 4	0 4	0 4	0 5	0 5	0 6	0 6	0 7	100			
										0 6	0 7	0 7	0 7	0 8	0 8	0 9	0 10	0 10	0 11	0 12	0 12	0 13	200			
										0 6	0 7	0 8	0 9	0 10	0 11	0 12	0 13	0 14	0 15	1 0	1 1	1 2	300			
										0 8	0 10	0 11	0 12	0 13	0 14	0 15	1 1	1 2	1 3	1 4	1 5	1 7	400			
										0 9	0 10	0 11	0 12	0 13	0 15	1 1	1 2	1 3	1 4	1 5	1 8	1 9	500			
										0 11	0 12	0 13	1 1	1 2	1 4	1 5	1 7	1 9	1 11	1 12	1 14	2 1	600			
										0 11	0 12	0 15	1 1	1 3	1 5	1 7	1 9	1 11	1 13	1 15	2 1	2 3	700			
										0 12	0 14	1 0	1 3	1 5	1 8	1 10	1 13	2 1	2 4	2 6	2 8	2 11	800			
										0 13	1 0	1 3	1 5	1 8	1 11	1 13	2 0	2 3	2 5	2 8	2 11	2 14	900			
										0 15	1 2	1 5	1 8	1 11	1 14	2 1	2 4	2 7	2 10	2 13	2 15	3 3	1000			
										2 10	3 0	3 6	3 12	4 1	4 7	4 13	5 3	5 9	5 15	6 5	6 11	7 1	2000			
										2 4	3 6	4 7	5 0	5 9	6 2	6 11	7 4	7 13	8 6	8 15	9 8	1 0	3000			
										4 7	5 3	5 15	6 11	7 7	8 3	8 15	9 11	10 7	11 3	11 14	12 10	13 6	4000			
										5 9	6 8	7 7	8 6	9 5	10 4	11 3	12 1	13 0	13 15	14 14	15 13	16 11	5000			

Chart showing quantities of Soda Carbonate to be used in neutralising Acid in Cream when it is desired to reduce the Acid to either 0.25 %, 0.27 %, or 0.29 %.

FAT LAMB RAISING.

SOUTHERN EXPERIMENTAL TESTS.

For a number of years the New South Wales Department of Agriculture has been demonstrating at experimental farms in the wheat belt of that State what a profitable branch of sheep-farming lamb-raising is when combined with wheat and other mixed farming. To determine which breed or combination of breeds gives the best result, tests have been carried out with practically every breed depastured across the border.

Following are the principal headings which had to be considered in the tests:—

1. The selection of a suitable breed or combination of breeds which would combine early maturity with the desired conformation in the lamb.
2. The selection of the breed or cross, the ewes of which would excel in milking properties.
3. The capabilities of the ewe flock as scavengers.
4. The breed or cross whose wool would be least affected by the action of the dust, &c., consequent upon the sheep being run on fallowed ground or stubble.
5. The selection of a ewe flock and a breed of ram which would mate at the period most likely to dovetail in with the ordinary workings of a mixed farm.

Summarised briefly the findings of the Department were as follow:—

1. (a) The most suitable ram: Of all the breeds tried the earliest maturing lambs were obtained from the Dorset Horn and Ryeland rams, closely followed by the Border Leicester. (b) The most suitable ewe: To obtain the earliest maturing lambs of the desired conformation, and of the standard export weight, *i.e.*, 33 lb. to 40 lb. carcase weight, it is necessary to depart from the pure Merino ewe and to use in preference a crossbred ewe; of those tried the Border Leicester x Merino ewe gave the best results, but it was found that there was little to choose between the Border Leicester x Merino and the Lincoln x Merino ewe.

2. Milking propensities of the ewe: It is generally conceded that the crossbred ewe excels in this direction.

3. All our experiments have proved that the crossbred ewe is far superior to the Merino ewe as a scavenger. Not only does the Merino ewe prefer pastures of a finer nature than are generally found on the fallows and stubbles of the mixed farm, but it has been proved consistently that the Merino ewe fails to thrive under these latter conditions.

4. Owing to the recent large advances in the Merino wool market many farmers have changed their flocks from crossbreds to Merinos in an endeavour to participate in the high prices ruling, but it must be emphatically stated that Merino wool deteriorates rapidly in strength and fibre and in general quality when subjected to a large amount of dust, such as is unavoidable when sheep are run on fallows and stubbles. Crossbred wool does not deteriorate to nearly the same extent.

5. Generally speaking, the mating period and the lambing period should be so arranged as to fit in with the general operations of the mixed farm, but the best results are usually obtained from the export lamb market by mating the ewes in December and January; thus having a late autumn lambing and the lambs ready for sale at the end of the lactation period in the spring. Of the breeds tried the Dorset Horn rams have been found to work earlier than other British breeds, and of the crossbred ewes the Border Leicester x Merino has given the best results in this direction. A large amount of difficulty has often been experienced in getting the Long-wool British breeds to work much before February or March.

In the experiments carried out by the Department it was found that there was little to choose, from the point of virility, between the Dorset Horn, South Down, Border Leicester, and Ryeland.

Lambs intended for export should not be shorn. They should be handled as little as possible and given every care so as to avoid knocking about with consequent damage to the carcase.

When selling the lambs from the different tests at Homebush, little difference was found between the mutton value of the different crosses. Weight of carcase appears to be the prime factor in distinguishing between the monetary value of the competing strains.

RESULTS OF TESTS.

Results of tests between rams of the Dorset Horn, South Down, and Shropshire breeds when mated with Lincoln x Merino, Leicester x Merino, and Border Leicester x Merino cross ewes:—

CROSS.

Ram.	Number of Lambs Sold.	Ewe Flock.	Price Realised.
South Down	215	Lincoln x Merino ..	19s.
South Down	238	Leicester x Merino ..	19s.
South Down x Merino ..	276	Border Leicester ..	19s. 1d.
Shropshire	226	Lincoln x Merino ..	18s. 10d.
Shropshire	237	Leicester x Merino ..	19s. 10d.
Shropshire x Merino ..	280	Border Leicester ..	19s. 9d.
Dorset Horn	220	Lincoln x Merino ..	20s. 11d.
Dorset Horn	246	Leicester x Merino ..	21s.
Dorset Horn x Merino ..	276	Border Leicester ..	21s. 10d.

(The tests covered a period of seven years, between 1912 and 1919, and the final returns, when averaged for the whole period, showed the Border Leicester x Merino ewe to the best advantage as the mother, and the Dorset Horn ram as the best sire, as seen in the above table.)

These results were obtained from the Wagga, Bathurst, and Cowra Experiment Farms.

In 1922 a test was carried out at Wagga Experiment Farm between the cross which had proved the best in all the Departmental experiments, *i.e.*, Dorset Horn ram mated with Border Leicester x Merino ewes, and the Corriedale ram mated with the Border Leicester x Merino ewes, as to which of these two breeds was the earliest maturing, and the following table shows the results obtained:—

Cross,			Ewes Mated.	Lambs Sold.	Average Price.	
Ram.	Ewe Flock.				s.	d.
Dorset Horn ..	Border Leicester x Merino ..		423	388	19	5
Corriedale ..	Border Leicester x Merino ..		423	383	16	9

It is worthy of note in this experiment that the average return obtained from the Dorset Horn cross lambs from every ewe mated amounted to 17s. 9d. per head, and in addition to this the wool from the ewes showed a net return of 10s. 6d.; thus a gross return from every ewe of the flock amounted to 28s. 3d. for the twelve months.

During 1922 and 1923 tests have been carried out at Bathurst and Cowra Experiment Farms between rams and the Dorset Horn and Ryeland breeds when mated with ewes of the Lincoln x Merino cross, and the table hereunder shows the profitable nature of lamb-raising at these two farms. In the table the results of the two farms have been combined:—

Ram.	Lambs Sold.	Average Price of Lambs Sold.	EWE FLOCK.		EWES.	
			Return per Ewe Mated for Lambs Sold.	Value of Wool per Ewe.	Total Mated.	Return per Ewe for Twelve Months.
		£ s. d.	£ s. d.	£ s. d.		£ s. d.
		1922.				
Dorset Horn x Lincoln-Merino	173	1 3 10	1 0 9	0 10 3	197	1 11 0
Ryeland x Lincoln-Merino	129	1 1 10	0 19 0½	0 10 3	148	1 9 3½
		1923.				
Dorset Horn x Lincoln-Merino	181	1 8 4	1 3 11¾	0 10 4	214	1 14 3½
Ryeland x Lincoln-Merino	182	1 9 0½	1 4 8½	0 10 4	214	1 15 0½



PLATE 51.—THE GRAND PARADE, ROYAL NATIONAL EXHIBITION, BRISBANE, 1924.

ROYAL NATIONAL EXHIBITION.

THE WEALTH OF QUEENSLAND'S FORESTS, FIELDS, AND PASTURES—
A STRIKING PAGEANT OF THE STATE'S VIBRANT PROSPERITY—
A TRIUMPH OF ORDERED RURAL INDUSTRY.

Of all the undeveloped countries in the world to-day, Queensland, with its illimitable reservoir of potential wealth, is the land of the young man, the land of the future.

In climate Queensland is particularly well blessed. Its whole range embraces the winter snows on the Southern uplands, the dry atmosphere of the Western plains, and the summer humidity of Northern coastal canefields. Every known economic plant, requiring either temperate or torrid conditions, can be produced prolifically within its borders.

No other country can claim the possession of richer pastoral, agricultural, and mineral resources.

In all the world to-day no land offers greater opportunity to the skill, will, and character of men.

Geographically, Queensland is in a position to supply economically the wants of the Asian eastern mainland, and the Pacific Archipelagos.

The granitic character of her pioneers is expressed in the development we see to-day on the threshold of Queensland's second century—a progress that constitutes the greatest epic in the history of British Colonisation, a progress made fully manifest in Brisbane's record Show of 1924.

Brisbane in all her panoply of spring glory provided a fine setting for the staging of the great annual event. This year the Exhibition was associated with the Centenary of the discovery and exploration of the beautiful river on which the capital stands so picturesquely. No more fitting way of demonstrating the progress of the State during the first hundred years of settlement could be conceived.

Year after year the Royal National Society adds success to success, but its 49th Annual Show, from 11th to 16th August this year, eclipsed all previous achievements. The return of bountiful seasons was made evident by the excellence of the exhibits in every section. District Exhibits and One-farm displays were again outstanding features. The general prosperity of the State was reflected in vast daily attendances of eager, well-dressed, and orderly crowds. On the official opening day more than 75,000 people congregated around the historic arena. The Agricultural Exhibits in the several regional competitions were of a particularly high order. Cotton, Queensland's new industry, was well represented in each competitive section. The Court of the Department of Agriculture and Stock was in itself a complete representation in miniature of every branch of rural industry in the Commonwealth's most richly endowed State. In the Court the science and practice of agriculture and animal husbandry were demonstrated educationally in a most practical and business-like way. Among individual displays those of the Forest Service and British-Australian Cotton Association stood out in strong relief. A representation of the activities of the Technical College illustrated what is being done by the Education Department in practical and progressive training of apprentices—the skilled tradesmen and women of the future. The practical results that have followed the institution of mobile-domestic science schools on our State railways were demonstrated arrestingly. This side of the Government's modern rural educational policy was one of the brightest

features in the pavilion displays. Another remarkable feature was the wonderful display of motor vehicles and power tractors that filled the John Reid Hall and the associated annexe, and supplied striking evidence of what might be called the industrial revolution that has followed the development of the internal combustion engine and its corollary in the wheeled utility and luxury of the petrol era. The Fruit Annexe was an excellent show in itself. Probably no better collection, in variety and excellence, of temperate and tropic fruits could be staged in any other country.

In the Stock Sections, sheep, cattle, horses, and pigs showed marked improvement. The Clydesdales and stud pigs purchased in the South by the Government for improving the breeds of home-reared stock were popular ring and pen attractions. A finer muster of hacks and hunters was probably never seen in the Brisbane arena. Competition in every class was keen and the decisions of the judges appeared to give general satisfaction. As compared with the Shows of former years the only noticeable falling-off was among the entries and competition in the stud beef cattle classes, due probably to the present economic condition of the meat industry.

His Excellency the State Governor, Sir Matthew Nathan, opened the Show. Others present at the official ceremony were His Excellency the Governor-General, Lord Forster, the State Premier, Hon. E. G. Theodore, the Minister for Agriculture and Stock, Hon. W. N. Gillies, Messrs. E. G. E. Scriven, Under Secretary, Department of Agriculture and Stock, Ernest Baynes, President of the Royal National Association, J. Bain, Secretary of the Association, and Mr. H. C. Quodling, Director of Agriculture.

This year every factor was in the Society's favour—a week of perfect Queensland weather, record exhibits in number and quality, record attendances from all parts of the country and other States, and capital organisation. Strong in every feature this year's Show was worthy of the State and the great basic industries upon which its present prosperity has been founded.

THE AGRICULTURAL COURT.

REPRESENTATION AND REVIEW OF DEPARTMENTAL ACTIVITIES.

In keeping with the auspicious occasion—Brisbane's Centenary—a fitting and unique display had been prepared by the Department of Agriculture and Stock in the spacious court set apart for the purpose in the Exhibition annexes. In effect, it was a representation of the work and activities of a number of officers of the department engaged in instructional and technical services associated with primary production.

The dominant note throughout was the completeness of detail with which the exhibits in each section had been prepared and described, which in itself was a silent testimony of the whole-hearted interest which the departmental officers have in their work. Efforts such as these are indubitably of national interest and importance in educating both the primary producer and those dependent on him, to the realisation of the fact that scientifically controlled production of food and textiles is not only a noble occupation, but is one well worthy of the fullest possible support of every person interested in the problems associated with the growth and development of this great State.

Exhibits included in the several parts of the court were:—

Sugar.

Varieties of sugar-cane grown at the Bundaberg and Mackay Sugar Experiment Stations, in proximity with which was much detailed information respecting sugar experiment work and the industry generally.

Wool.

Fleeces of wool representative of the best types grown in the State. Educative cards and detail illustrative of the processes of manipulation of wool from the raw material to the finished article; also a unique record of the B.A.W.R.A. operations.

Dairy Products.

These were shown in the progressive stages of manufacture; their uses. Milk, its composition, uses, and commercial products. Composition and food values of dairy products. Factories: Butter and cheese. Statistical and other information. Photographs and illustrations of live stock and factories.

Bacteriological Laboratory.

This display, embraced in the dairy section, was illustrative of micro-organisms of milk and milk products; and of pasteurisation of milk in the home as a means of preventing milk-borne diseases. The housefly, as a disease-carrier, formed one of several very practical and popular series of subjects with which the general public, for their own protection, should be more familiar.

QUEENSLAND'S WEALTH IN WOOL

This year was shown samples in the form of fleeces of the very best wools of the State. Besides the wool in the cases, there were a number of cards illustrating the processes of manipulation which wool undergoes, from the greasy wool sent from



PLATE 52.—ARRIVAL OF HIS EXCELLENCY THE GOVERNOR, SIR MATTHEW NATHAN.

the woolgrower, right along to the finished article—worsted and woollen cloth. Tops of various counts, the combed product of wool noils, the waste left by the combing process, carbonising wools and the product, greasy combing and clothing wools with the scoured product, were mounted on cards designed to illustrate what is really a very small number of the many processes which wool undergoes.

Nine highly technical pictures were shown to illustrate the statistics of the B.A.W.R.A. operations. They are of the very greatest value to the wool trade in Australia and, in fact, to the whole world.

QUEENSLAND'S RICH NATURAL PASTURES.

The collection of grasses made at the Gindie State Farm this season, and named and described, were representative of the greatest natural asset Queensland possesses. Interest was added to the exhibit by a number of photographs of Suffolk-Punch horses and beef Shorthorn cattle raised and fed on the natural pastures from which the samples on exhibition had been drawn. Gindie is carried on as a stud



PLATE 53.—HIS EXCELLENCY THE GOVERNOR, SIR MATTHEW NATHAN, DECLARING THE 1924 SHOW OPEN.



PLATE 54.—A SECTION OF THE GRAND PARADE, ROYAL NATIONAL SHOW, BRISBANE, 1924.

stock farm for the improvement of certain breeds of livestock—Clydesdales and Suffolk-Punch draught horses and beef Shorthorn cattle.

Queensland has always had a high reputation for the richness of its natural pastures, and the comprehensive collection of native grasses and forage plants staged by the Department bore testimony that the reputation is well founded. Among the Andropogons are the far-famed Queensland Blue Grass and Satin Top. The former is one of the most palatable and fattening grasses we possess, but is not particularly drought-resistant and is easily eaten out, with the consequence that many blue grass pastures have deteriorated during recent years as a result of heavy stocking. The genus *Astrebla* contains the well-known Mitchell Grasses, of which Queensland possesses four distinct kinds—more than any other State. The drought-resistant qualities of these and other grasses of the West are well known, a characteristic being their rapid recovery after rain. Among the Star Grasses, to the same genus of which belongs the imported Rhodes Grass, are several highly esteemed for their fodder value. The genus *Anthistiria* contains the well-known Kangaroo Grass and the Tall Oat Grass. Closely allied to these is the Flinders Grass (*Isiclema*), one of the most nutritious grasses probably extant and relished by stock when dry as well as green. It is a mass of grain heads, hence, no doubt, its high nutritive value. One of the largest genera of grasses is the genus *Panicum*, of which quite an array of species were shown. They are mostly of high value and occur in mixed pastures rather than in pure stands. One of the best is the Shot Grass (*Panicum globoideum*), which bears long spikes of shot-like grain, and is therefore exceedingly nutritious. Among other grasses shown were some especially adapted for wet and swampy situations, such as Rice Grass, Swamp Couch, Water Couch, *Panicum obseptum*, and *Panicum proliferum*. Button Grass, Crow's Foot, native paspalums, and sorghums, and other grasses all found a place in this comprehensive array.

EDIBLE TREES AND SHRUBS.

Among the more remarkable and valuable features of Australian vegetation is the number of trees and shrubs, particularly in our open western country, that may be used as food for stock. The collections shown of about thirty sorts proved interesting and instructive to pastoralists, stockowners, and farmers generally. Among the many varieties displayed were the Mulga, Kurrajong, Apple Tree, Wild Orange or Bumbil, Beelah, Emu Bush, Whitewood, Myall, Cattle Bush, Red Ash, and Broad-leaved Sally. All these and others have helped to keep cattle alive and in good condition during long spells of dry weather. The propagation, conservation, and utilisation of these valuable trees is a matter of national importance. The Botanical Division of the Department is always willing to report on any samples of plants sent for identification and information by farmers, pastoralists, or others interested.

THE SUGAR INDUSTRY.

DISPLAY BY THE BUREAU OF SUGAR EXPERIMENT STATIONS.

The varieties of cane exhibited by the Bureau of Sugar Experiment Stations included a number of new varieties from Hawaii, Java, and Mauritius. Other varieties shown were raised in Fiji and Queensland.

One of the objects of the Sugar Experiment Stations is the introduction and testing of new varieties. Before any cane varieties are allowed to leave the experiment stations they have to pass chemical and commercial trials through plant, first ratoon, and second ratoon crops. Each variety is tested not less than four times in the course of the sugar season, so that records are obtained giving farmers and mill-owners information as to whether canes are early or late, and as to whether their sugar contents are sufficiently high to warrant their adoption. This is combined with agricultural trials in the field, so that it may be determined whether such varieties are good croppers. They are further keenly watched for evidence of disease, and no affected canes are allowed to go into distribution.

When varieties have passed these trials they are carefully examined and packed before being sent to growers living at a distance from the stations. Farmers close at hand are permitted to visit the stations and remove varieties selected for distribution. All canes are distributed free to canegrowers, the worthless varieties being discarded. Information of this kind could only otherwise be secured by growers and millers at the cost of much time and money, and the rejection of many useless canes by the mills, which would be accompanied by severe loss to the growers.

Full descriptions of the varieties exhibited appeared on cards attached to the cane, which also gave commercial cane sugar content. Many of these canes are at

present undergoing chemical and field tests, while others have passed the probationary period, and are being distributed to canegrowers. These varieties, however, comprise a very small part of the number of new and tested canes that have been distributed from the experiment stations in the course of the past twenty years. The Sugar Experiment Station at South Johnstone, near Innisfail, has during the past three years been engaged in the direction of raising cane from the seed found in the arrows. This requires the utmost care, as the seed is very minute, and has to be most carefully handled. Specially prepared boxes of soil are used, which have previously been sterilised.

The cane arrows when mature are gently broken off, spread over the soil, watered, and then covered with glass plates. When germination takes place, a large number of minute shoots like grass appear. When these have made further growth they are carefully pricked out into pots or boxes, and are ultimately removed to the field.

At the present time upwards of 600 seedlings have been raised, and the best of these have been selected on their physical appearance and planted. At the present time a great number of them are being tested chemically with a view to ascertaining whether they are likely to be good sugar producers. Several of them which were taken from Badila cane have Badila characteristics, and it is trusted that a cane equal to the Badila will be discovered.

Scientific Farming.

Work at the Experiment Stations also comprises the study of soils, cultivation, and fertilising. It is sought to introduce improved methods of cultivation, liming, fertilising, rotation of crops, and conservation of moisture, and growers are taught the principles of cultivation and business methods by visits to the Experiment Stations, by lectures and addresses delivered in the various sugar districts, and by the issue of bulletins. It may be claimed that this work has been highly successful. The Sugar Experiment Stations analyse soils free for canegrowers, and give advice by personal interviews or by letter on the requirements of the soil in the way of application of lime where necessary, green manuring and fertilisers, and the treatment of the land by proper soil handling. Upwards of 1,000 cane soils have so far been analysed. Cane samples are also tested free of charge, so that growers may know the best time at which to cut their cane. Field officers move around among farmers giving advice on cultural operations.

Research Work.

Investigation and research work in connection with the sugar-cane's most serious pest—viz., the grub—is now being carried out by the Bureau of Sugar Experiment Stations in a systematic manner, and numerous bulletins have been issued upon the subject. The Entomological Laboratories are situated at Meringa, near Cairns, which is the centre of the worst grub-infested region in North Queensland. A chemical fumigant called para-dichlorobenzene has been successfully used during the past twelve months in the destruction of cane grubs.

Economic Value of Cane Cultivation—Its National Significance.

The work of the Sugar Experiment Station, in relation to its promotion of the agricultural welfare of Queensland, in connection with the sugar industry cannot be over-estimated. When it is considered that this industry is the greatest agricultural one in Queensland, and will produce a yield of 330,000 tons of sugar this year, estimated to be of the value of £9,000,000, it can be seen how highly necessary it is that it should be assisted and encouraged in every possible way. Apart from its economic value, however, it has a deep national significance, and has already played a very large part in peopling the North. According to the recent census, the increase in population in the last ten years in the Herbert electoral division was 19·4 per cent., or 14,929 persons, a greater increase numerically than in any other part of the Commonwealth. Queensland's sugar production in 1867 was 338 tons, and this year should be about 330,000 tons.



PLATE 55.—QUEENSLAND'S RICH NATURAL PASTURES—A PANEL OF NATIVE GRASSES.

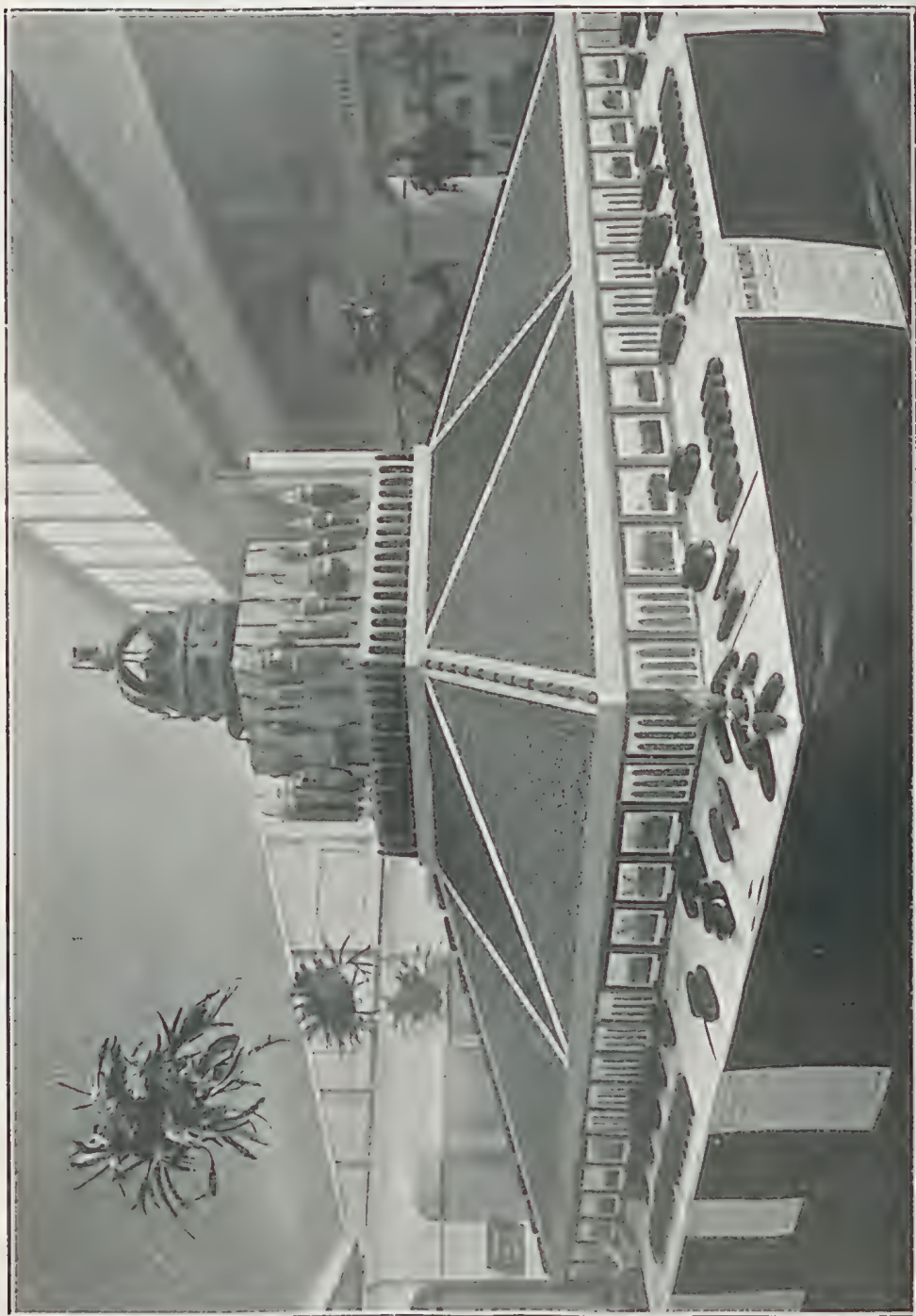


PLATE 56. MAIZE IS KING CENTRAL TROPHY, COURT OF THE DEPARTMENT OF AGRICULTURE AND STOCK.



PLATE 57.—WEST MORITON DISTRICT EXHIBIT



PLATE 58.—THE PLANT BREEDERS' TRIUMPH—NEW VARIETIES BRED FROM QUEENSLAND CONDITIONS.
A PANEL IN THE DEPARTMENTAL COURT.

Successful White Labour Production.

Australia is the only place in the world where cane sugar is produced by white labour. We are in competition with countries which produce sugar by black labour and under black labour conditions. In Java, wages are only about 1s. per day, the worker keeping himself.

About £15,000,000 are invested in the Queensland sugar industry. It is the greatest agricultural industry in the State. No other branch of agriculture in Australia employs so much manual labour. The yield of cane and sugar per acre is improving, due to better methods of cultivation and growth of superior canes. The mills have also largely increased their efficiency.

How the Industry has Developed.

It is extremely interesting to note the remarkable increase that has taken place in the sugar yield in districts north of Townsville. It has always been recognised that these districts, with their high rainfalls and humid climate, are essentially fitted for canegrowing. Their development since 1912 has been going on apace, and a far larger increase in population has taken place in the past twelve years than in any other portion of Queensland. Freedom from droughts and frosts are important factors.

Taking the increase every three years from 1910 to 1922, one gets the following figures, to which are added the yield since 1922:—

1910.—Above Townsville, 7 mills, 57,135 tons; below Townsville, 42 mills, 153,621 tons.

1913.—Above Townsville, 7 mills, 62,414 tons; below Townsville, 41 mills, 180,423 tons.

1916.—Above Townsville, 9 mills, 98,396 tons; below Townsville, 38 mills, 78,577 tons.

1919.—Above Townsville, 9 mills, 101,351 tons; below Townsville, 33 mills, 60,785 tons.

1922.—Above Townsville, 9 mills, 120,617 tons; below Townsville, 31 mills, 167,618 tons.

1923.—Above Townsville, 9 mills, 160,000 tons; below Townsville, 29 mills, 109,175 tons.

1924.—Above Townsville, 9 mills, estimate 168,000 tons; below Townsville, 29 mills, estimate 162,000 tons.

The area under cane since 1910 has increased 100 per cent. Two new sugar-mills have been erected, a third is now in course of erection, and the seven original mills have all considerably increased their efficiency and capacity. The increase in the yield of sugar achieved by districts north of Townsville since 1910 has more than doubled. In this development the Government of Queensland has played a large part in erecting new mills and encouraging the sugar industry in every possible way.

WHEAT.

The eminently practical system of breeding wheats at the Roma Wheat-breeding Farm to suit Queensland conditions were fully demonstrated by an excellently arranged series of specimen plants mounted on screens. A detailed explanation of the Mendelian theory of plant-breeding and of the inheritance of certain characteristics were featured in a most instructive manner, enabling the student to recognise and trace these in the first and second filial generations.

Wheats bred at Roma, after undergoing exhaustive tests, are passed on to officers of the field branch, who try them out under varying conditions in different districts to determine their suitability to Queensland conditions. Valuable work is being done. Two seasons ago upwards of 500 acres were sown with new varieties, the test plots being spread over a wide range of country, with the result that a high average yield of 22½ bushels per acre was obtained, the maximum yield being 40 bushels per acre. Facts such as these indicate the practicability of scientifically-controlled wheat improvement work.

MAIZE.

On the maize trophy, situated centrally in the Court, the several varieties undergoing improvement were shown. Different phases of the work of selecting seed and the methods employed to improve the yield and standard of quality of Queensland's principal cereal were shown. Proof of the success of these methods is to be noted from the records established in the matter of crop yields, 116 and 117 bushels per acre having been obtained with this seed from a four and a five months' variety respectively when grown under field conditions. High productivity and uniformity of type, combined with other essentials, were featured in the exhibit. A corollary to this scientific method of seed improvement is to be found in its practical application to a scheme for the regular distribution by the Department of Agriculture of approved highly productive stud seed corn.

Tested and Proved Varieties.

Improved Yellow Dent is a five to five and a-half months' variety, suitable for scrub lands and coastal districts; particularly on alluvial soils and where there is a good rainfall. This is a proved heavy yielder, having returned, under field conditions, over 100 bushels to the acre.

Golden Beauty is a medium late variety, taking from four and a-half to five months to mature, a heavy yielder, also a good fodder corn. A very hardy variety, and has a very high shelling percentage.

Star Leaming is a medium early variety, about four months, and one of the best of the early varieties. Very suitable for early or catch crops, and where there is a short growing season. Ears are very heavy and compact.

Reid's Yellow Dent is a four months' variety and a splendid yielder. This is also a suitable maize for districts where there is a short growing season, and is an excellent fodder corn. This season a plot of this variety yielded 96 bushels per acre from 4 acres.

Funk's Yellow Dent is another four months' variety, also a good yielder. Ears are weighty and very tightly packed. Like Reid's, it is suited for early crops, or districts which have a short growing season; also a good fodder corn.

Funk's 90-Day was imported two years ago by the Department, with the idea of securing a high yielding type to meet an insistent demand for a quick maturing variety. Excellent results have been obtained. The variety has proved to be a good yielder and an ideal variety for the purpose for which it was imported. It can also be recommended as a good fodder corn.

COTTON.

The display of the cotton section this year had been prepared from an educational point of view rather than as a general spectacular feature of the Show. It is believed that the cotton-growing industry has passed the phase where it needs to be boomed and kept before the public, and that more attention should be paid to the fundamental points of cotton-growing.

With this object in view, the exhibit this year embraced various features illustrating the proper method of thinning; the effect of closely spaced and properly spaced plants; the effect of droughty conditions on properly spaced plants when grown on improperly prepared seed beds, and the development of the root system of plants grown on well-prepared and poorly-prepared seed beds.

On a separate stand a comprehensive display was arranged of various features illustrating important phases in connection with the matured cotton, such as a set of the standard grades of seed cotton which are used in grading Queensland cotton with samples of lint obtained from the corresponding grades; a chart illustrating the relationship of the Queensland set of grades to the world's universal standard set of grades; samples of seed cotton illustrating the effect of trash and foreign matter on mature and immature grades; samples of seed cotton of the ordinary and Durango

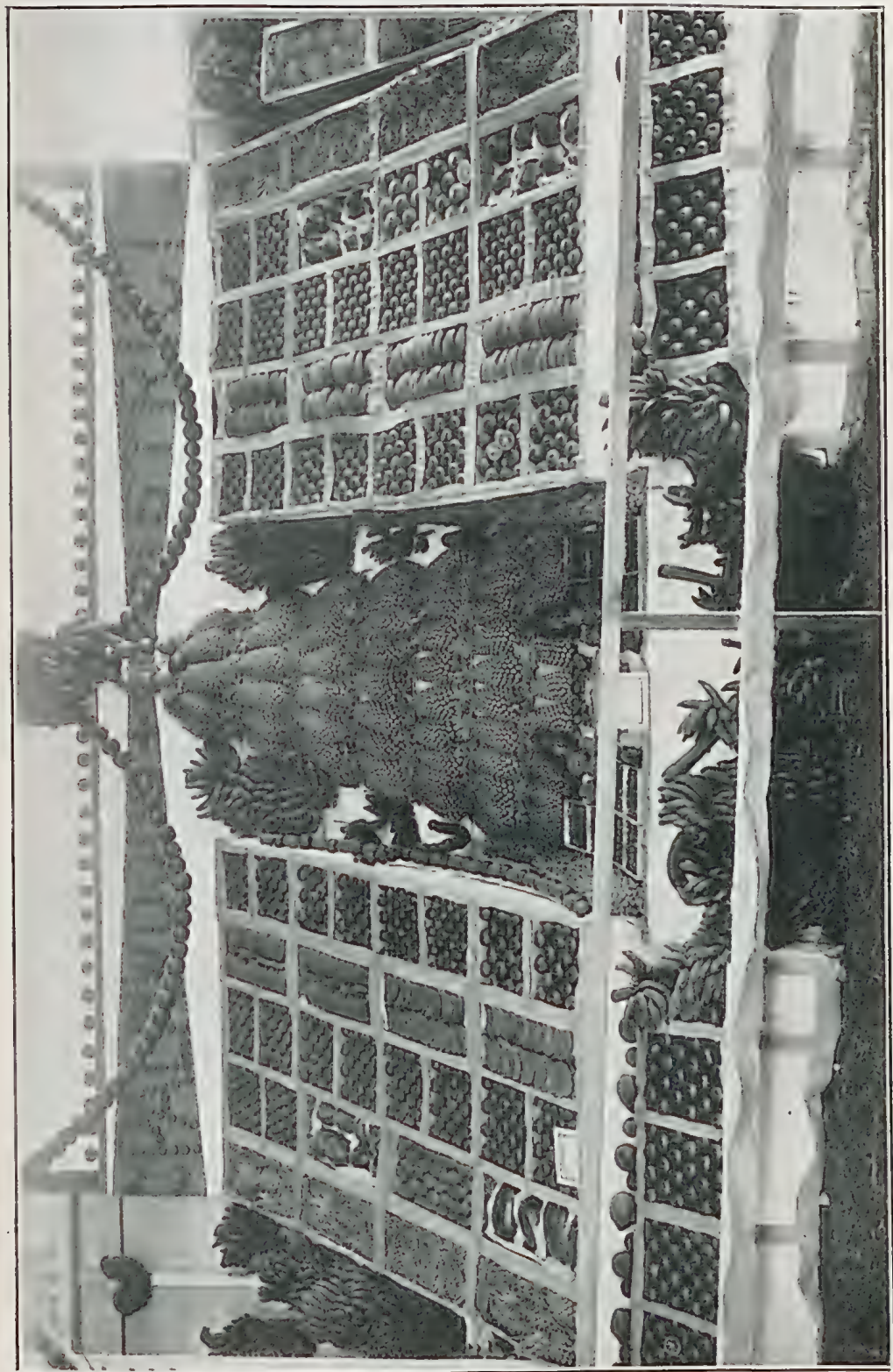


PLATE 59.—FRUIT FROM THE NORTH COAST COURT—PALMWOODS DISTRICT EXHIBIT.



PLATE 60.—QUEENSLAND'S WEALTH IN WOOL ILLUSTRATED, DEPARTMENTAL COURT.



PLATE 61.—AN INSTRUCTIVE COTTON EXHIBIT, DEPARTMENTAL COURT.

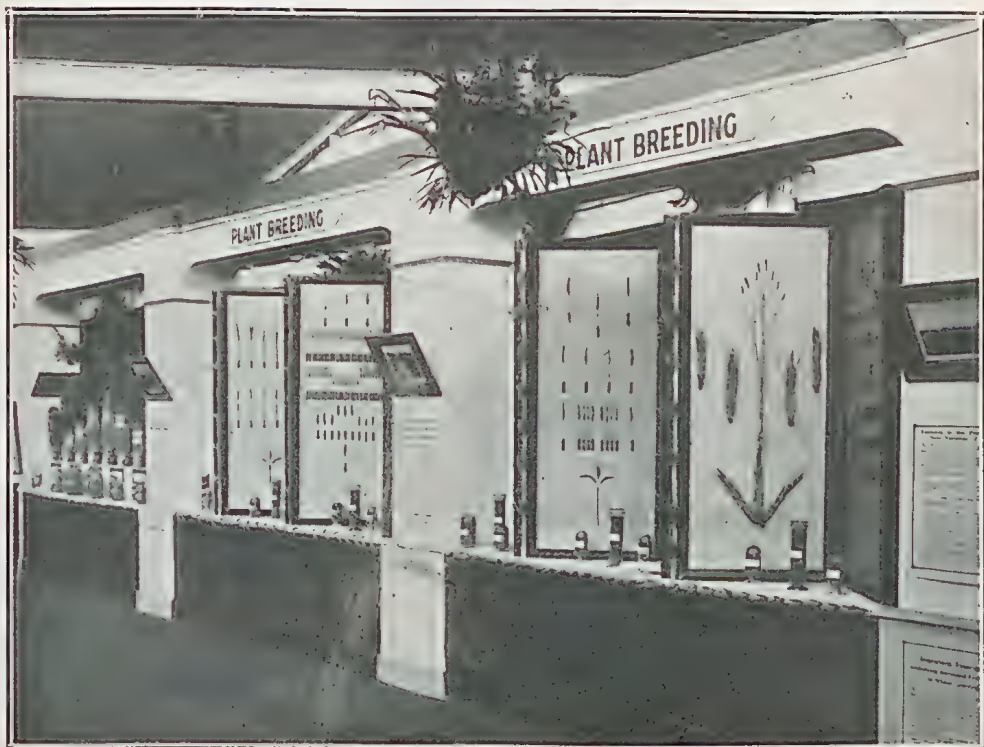


PLATE 62.—THE SCIENCE OF AGRICULTURE ILLUSTRATED—DEPARTMENTAL COURT.

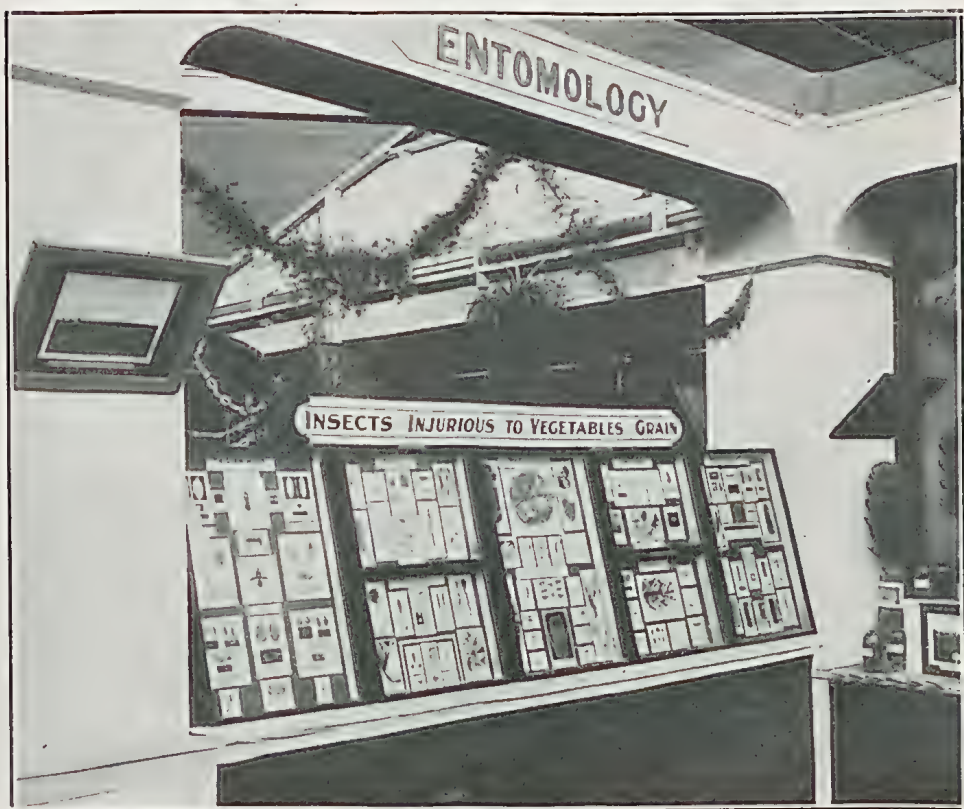


PLATE 63.—SCIENCE AIDS THE FARMER—THE ENTOMOLOGIST'S EXHIBIT, DEPARTMENTAL COURT.



PLATE 64.—THE PALM-SHADED JUDGING RING, BRISBANE SHOW GROUND, 1924.



PLATE 65.—JUDGING AYRSHIRES, ROYAL NATIONAL SHOW, BRISBANE, 1924.

varieties to illustrate the greater uniformity of the latter, which is the variety that the department is distributing at present; panels of combed fibres on the seed to show the uniformity of the Durango cotton.

As the by-products of the cotton crop are of great importance, a representative display of the products of the oil mill was also shown, which included samples of crude oil, refined glycerine, cotton-seed cake, cotton-seed meal and cubes, and the delinted seed.

SWEET POTATOES.

The nomenclature and classification of sweet potatoes has been carried on in the Central district for some years. The exhibit, comprising upwards of forty varieties, had been arranged to furnish the fullest possible information on the merits of the several varieties. Extraordinarily high yields have been obtained on small experimental areas, exceeding in the case of cattle varieties 30 tons per acre.

THE DAIRYING INDUSTRY.

The display in the dairy section had been designed for the purpose of giving prominence to the importance of the dairying industry in Queensland, and to impress upon the minds of visitors to the Royal Show the necessity for and the intrinsic value of dairy foodstuffs in the dietary of humans. An endeavour had been made also to conserve the instructive and educational value of the exhibit.

The composition of milk, and the many purposes for which milk is used, were clearly shown. The principal commercial products made from milk were featured,



PLATE 66.

In 1915 the annual value of dairying to Queensland was approximately £1,500,000. Its present annual value, exclusive of by-products, is approaching £7,000,000. In the State there are 563,683 head of dairy stock on 22,876 dairy farms. A display in the Departmental Court illustrating how the Government aids the Industry.

together with the more important by-products. The composition and food values of dairy products were also displayed in concise and attractive form.

Butter and cheese were shown in the progressive stages of manufacture. With a view to emphasise the growth of the industry and the numerous companies which are at present engaged in the manufacture of butter or cheese, there was staged as a background to the trophy a full range of the registered brands under which the factories' product of first quality is marketed.

PIG RAISING.

This exhibit was prepared for the purpose of illustrating the possibilities of pig raising in Queensland, special reference being made to the several breeds of pigs considered to be most suitable to our climatic conditions. Much useful information was displayed on printed cards; and a number of illustrations of factories and other items of interest were also shown. A special exhibit of pig foods were on view, together with detailed information as to their value, and the most suitable combinations for maintenance and fattening purposes.

A display of bacon was also made to indicate that over-fat, extra-heavy, and otherwise faulty pigs are unprofitable to market in this condition.

The Department of Agriculture and Stock is giving special attention to the pig raising industry. Space was allotted in the Department's Court for a display of particular interest to the pig farmer. A well-illustrated and informative brochure had been prepared for distribution to those most interested. This publication, the first of a series of pamphlets on the subject of pigs, deals in general terms with matters of special import in relation to the growth and development of the industry. The title, "Pigs for Profit," in itself creates a desire for further information, and as Queensland this year has a record crop of maize particular reference is made to its usefulness for the purpose of fattening pigs.



PLATE 67.—THE JOURNAL CORNER, DEPARTMENTAL COURT.

Typical Stud Pigs.

Displayed in a prominent position in this section were enlarged photographs of typical stud pigs of the several types most suited to Queensland conditions. The Berkshire is the most popular and widely distributed of all the modern breeds. The Tamworth, the old English wild pig, has now been thoroughly domesticated and improved to such an extent that he is regarded as of especial value for crossing with Berkshires and other medium types for the production of ideal bacon pigs. The Poland-China is an American type, admirably adapted for use in producing the lighter weight bacon pigs now so much in request, and the Middle Yorkshire is the famous old Yorkshire cottagers' pig that, perhaps, is not quite so suitable for our warmer climes.

The Duroc-Jersey, a popular American and Canadian type, and the Gloucester Old Spot, an old Gloucestershire pig, both quite recently introduced into Australia, are, perhaps, not so well known here. Special reference is made to these in the brochure and to their value for our trade.

Another attractive feature depicted sides and pieces of bacon from pigs that had been injured in transit to market. The pig industry suffers loss to the extent of thousands of pounds annually through careless handling of the stock prior to the time they are actually slaughtered.

Much useful information was displayed on printed cards having special reference to the industry, and to the possibility of its extension throughout the State. A photograph of the North Queensland Co-operative Bacon Factory, recently opened at Floreat Siding, Mareeba, on the Cairns-Atherton Railway, at a cost of £13,500, is in itself definite proof that the pig is proving of value in those great maizegrowing and mixed farming districts in the Northern division of the State.

Variety of Foods.

That there are a great variety of foods which can be successfully used for the purposes of raising pigs was demonstrated by a collection of suitable foods. These included both bottled exhibits and the foods as they are produced on the farm, such as artichokes, arrowroot, peanuts, sweet potatoes, and mangolds (root crops), maize, oats, barley, and wheat (cereals), cowpeas and field peas (legumes), grain sorghums, a grain crop, dwarf Essex rape, kale, Belgian field carrots, and sugar-cane (green crops), with pollard, bran, cotton-seed cake, molasses, and other concentrates.

An interesting exhibit of bacon unsuited to our market requirements through being overfat and too heavy, and otherwise faulty, attracted considerable attention. Farmers are losing money, it was pointed out, through marketing their pigs in an unsatisfactory over-weight condition.

STOCK DISEASES EXPERIMENT STATION.

The entire exhibit of the Stock Diseases Experiment Station at Yeerongpilly was illustrative of micro-organisms in milk and milk products. One section demonstrated the very important rôle that bacteria play in the milk and dairy industry. By means of diagrams, charts, plate, and tube culture, &c., it was shown that practically all the natural changes which take place in milk, whether good or bad, from the time that it is drawn to the time that it is consumed or otherwise used are due to the action of the various milk-borne diseases.

Another section dealt with the pasteurisation of milk for home use. It was clearly demonstrated that by heating milk for ten minutes at a temperature of 160 degrees Fahr. the germs of typhoid, diphtheria, tubercle, and the various septic bacteria are readily destroyed, while if the milk is subsequently kept cool it will keep perfectly sweet for a much longer period than untreated milk.

There was a large collection of the kinds of micro-organisms which have been isolated from butter, cream, cheese, and milk. These were shown growing in a pure state in tubes of artificial culture media, and included species of bacteria, yeasts, and moulds. There was a number of specimens of pathogenic bacteria isolated from milk, the most important being tubercle bacilli.

As a means of prevention of milk-borne diseases, pasteurisation in the home was advocated, and with ordinary kitchen utensils the simple methods for carrying out the process were shown. The advantages of pasteurisation are that the germs of tuberculosis, typhoid, and diphtheria are killed, while the milk will keep sweet for a longer period than untreated milk.

ENTOMOLOGY AND PLANT PATHOLOGY.

The Entomological Section was of a most comprehensive character and of high educational merit. Life histories of insects were clearly set out. Specimens of insects which attack, during their lifetime, fruit, vegetables, grain, cotton, and stock were exhibited. Insects of significance and which are the subject of special investigatory work at the present time are the fruit fly, the banana weevil borer, and the pink boll worm.

Several diseases affecting fruit and vegetables were illustrated most graphically.



PLATE 68.

How Queensland Dairymen are served by Science—The Yeerongpilly Stock Experiment Station's fine object lesson in the Departmental Court.

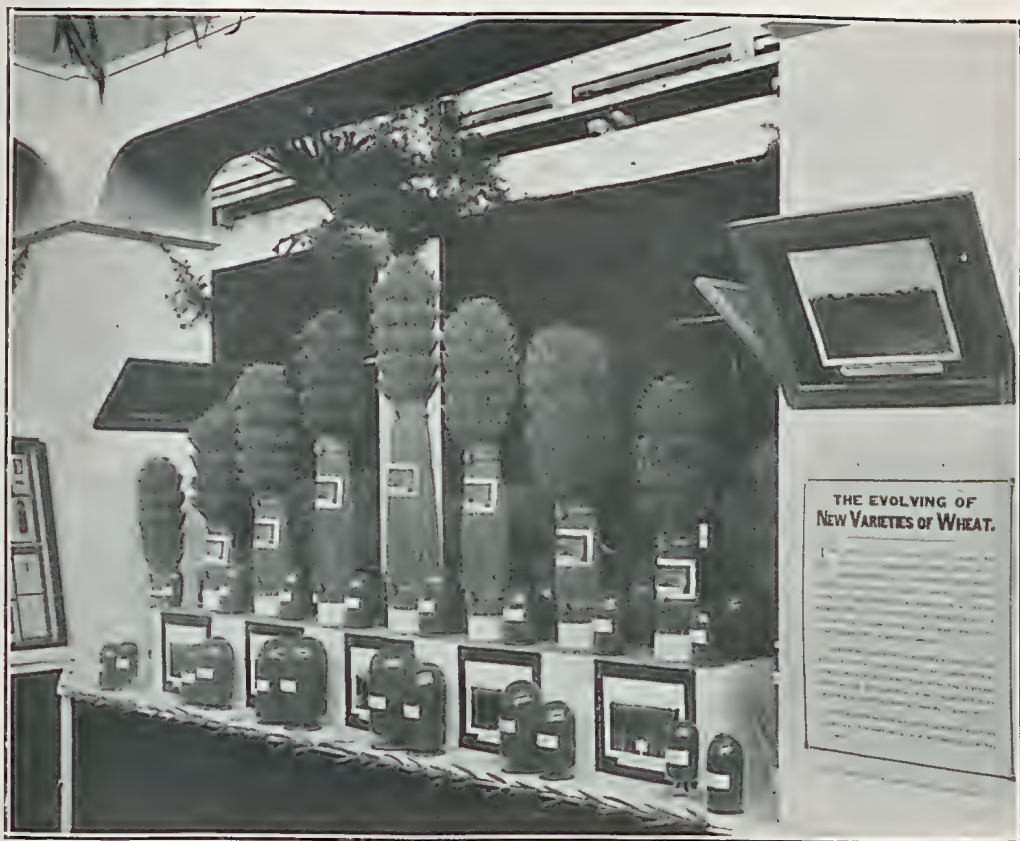


PLATE 69.—SUCCESSFUL WHEAT-BREEDING ILLUSTRATED IN THE DEPARTMENTAL COURT.

The plant breeder in search of certain characteristics makes a selection of parent plants and cross fertilizes the flowers to bring about a re-combination of characters with a corresponding increase in vigour; and seeks also to fix those desired in the progeny by selection.



PLATE 70.—JUDGING JERSEYS, ROYAL NATIONAL SHOW, BRISBANE, 1924.



PLATE 71.—CHAMPION FRIESIAN COW.
“Dairymaid,” the property of Mr. P. P. Falt.



PLATE 72.—CHAMPION AYRSIRE COW, 1924.
“Belle of Longlands,” the property of Mr. Jonas Holmes.

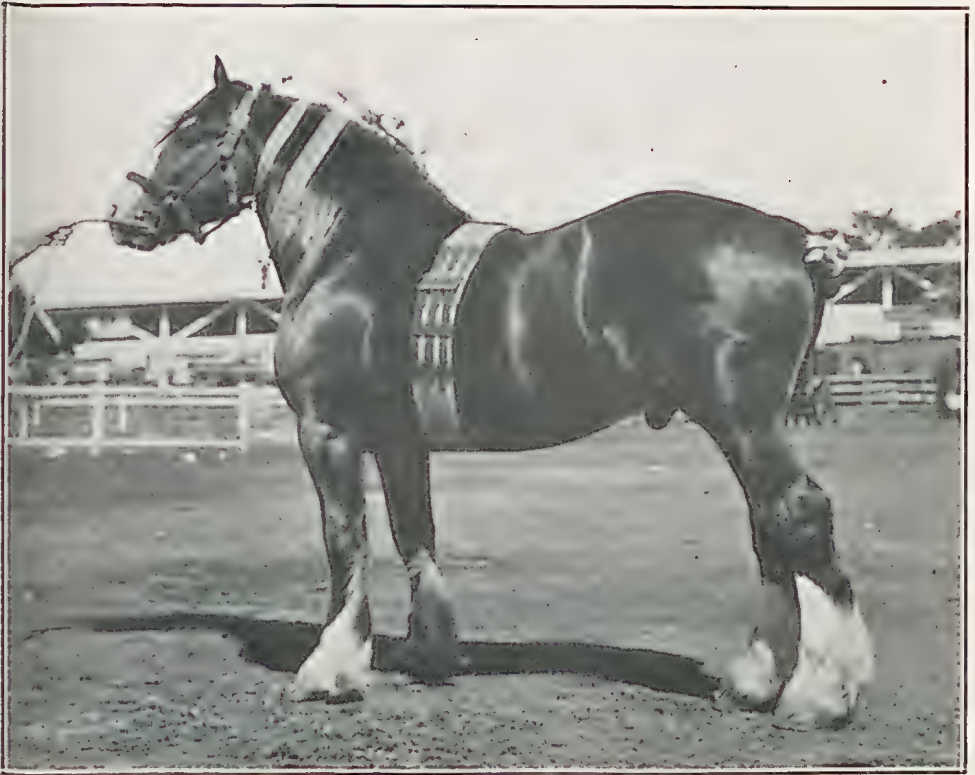


PLATE 73.—CHAMPION CLYDESDALE STALLION, 1924.
“Windermore Bay Kennedy,” the property of Mr. A. T. Croswick.

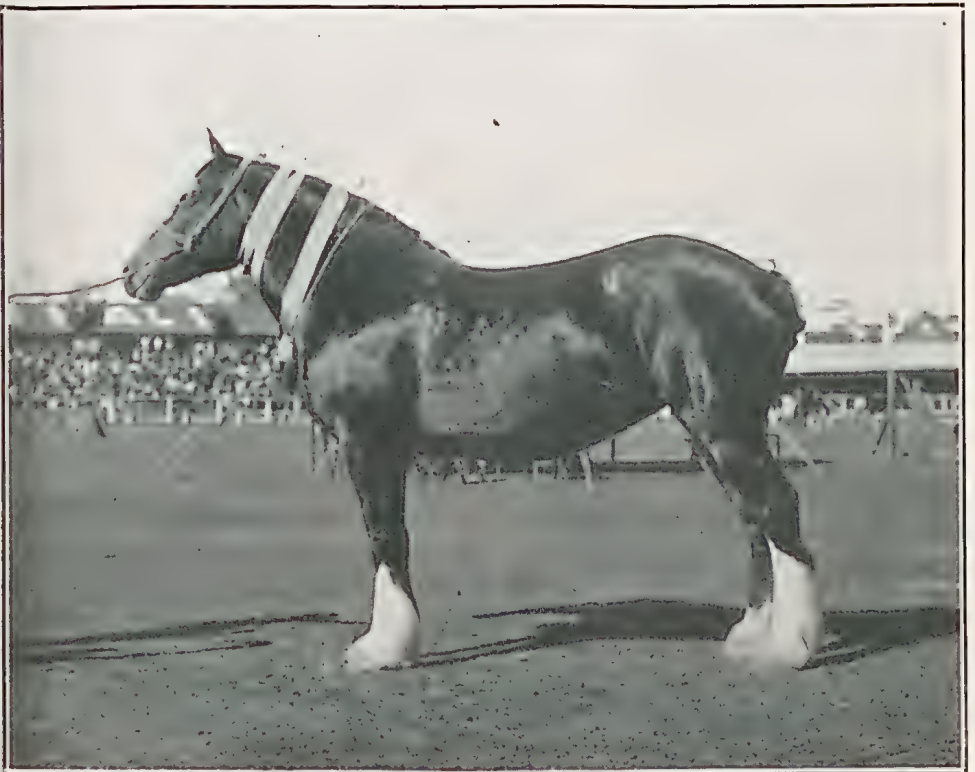


PLATE 74.—CHAMPION DRAUGHT MARE, 1924.
“Lady ‘Collus,” the property of Mr. Gavin Elliott.

THE AWARDS.

DISTRICT EXHIBITS.

A contest between West Moreton, the holders of the Chelmsford Shield, and Wide Bay provided a good competition. Both exhibits were very fine indeed, and in a comparison of the points it will be seen that in the grand total there is only a difference of 55½ points, and these were in favour of West Moreton. In the comparative table of points in the respective sections there were good competitions. West Moreton won in dairy produce, foods, grain, manufactures and trades, minerals, and building materials, hay, chaff, &c., wool, &c., enlarged photographs, and effective arrangement. Wide Bay won in fruit, vegetables, &c., tropical products, and wines, &c. They were equal in tobacco. It will be noted that in effective arrangement that out of a possible of 80 points West Moreton secured 77 and Wide Bay 71, so organisers of both paid close attention to details. As a result of their win West Moreton retains the right to hold the Chelmsford Shield for a further period of twelve months. Details:—

PRIMARY PRODUCTS AND MANUFACTURES.

CHELMSFORD SHIELD.

	Possible Points.	West Moreton.	Wide Bay.
(1) DAIRY PRODUCE—			
Butter, 1 box, 56 lb.	90	86	84
Milk, condensed, concentrated, or dried, and by-products	40	38	12
Cheese, not less than 1 cwt.	60	52	53
Eggs, suitable for domestic use; 1 doz. of each variety	20	17	16
	210	193	165
(2) FOODS—			
Hams and bacon	50	45	35
Rolled and smoked beef and mutton	20	15	8
Smallgoods and sausages, if smoked or preserved	10	10	5
Fish, smoked, preserved, and canned	10	4	8
Canned meats	25	20	8
Lard, tallow, and animal oils	20	15	12
All butchers' by-products, not included in any other part of scale of points	10	10	8
Honey and its by-products	20	18	19
Confectionery, factory-made	10	10	8
Bread, biscuits, scones, and cakes, factory-made	10	8	10
	185	155	121
(3) FRUITS, VEGETABLES, AND ROOTS—FRESH AND PRESERVED—			
Fresh fruits—all kinds	60	47	55
Preserved fruit, jams, &c.	30	24	28
Dried fruits	20	9	10
Fresh vegetables—all kinds, including table pumpkins, but excluding potatoes	25	15	12½
Potatoes, English and sweet	40	27	33
Preserved and dried vegetables, pickles, sauces, &c.	10	8	10
Roots—all kinds, and their products, arrowroot, cassava meal, &c.; samples not less than 1 lb.	14	9	12
Cocoanuts, peanuts, and other nuts	6	3	4
	205	142	164½

PRIMARY PRODUCTS AND MANUFACTURES—*continued.*CHELMSFORD SHIELD—*continued.*

	Possible Points.	West Moreton.	Wide Bay.
(4) GRAIN, &c.—			
Wheat	50	40	26
Flour, bran, pollard, macaroni, and meals prepared therefrom	10	..	9
Maize	60	42	38
Maizena, meals, starch, glucose, and cornflours ..	10	7	1
Oats, rye, rice, barley, malt, pearl barley, and their meals	30	25	22
	150	114	96
(5) MANUFACTURES AND TRADES—			
All woodwork	30	26	24
All metal and ironwork	30	24	26
Leather and all leather work and tanning ..	20	13	18
Manufactured woollen and cotton fibre	30	30	..
All tinwork	10	8	6
Artificial manures	10	8	6
Brooms and brushes	10	6	6
Manufactures not otherwise enumerated	15	10	14
	155	125	100
(6) MINERALS AND BUILDING MATERIALS—			
Gold, silver, copper, and precious stones	25	16	15
Coal, iron, other minerals, and salt	30	20	25
Stone, bricks, cement, marble, terra-cotta	20	20	12
Woods—Dressed, undressed, and polished; one face to be dressed and half of it polished; back to be rough; samples of wood to measure not less than 12 x 6 x 1 inch thick	25	24	23
	100	80	75
(7) TROPICAL PRODUCTS—			
Sugar-cane	60	25	58
Sugar (raw and refined)	20	10	20
Rum, spirits, and by-products	10	2	10
Coffee (raw and manufactured) .. .. .	..	..	..
Tea and spices	10	5	8
Cotton (raw) and by-products	30	22	23
Rubber	10	..	5
Oils (vegetable)	10	10	8
	150	74	132
(8) WINES, &c.—			
Wines	15	1	10
Aerated and mineral spa water, vinegar, and cordials	10	8	9
	25	9	19
(9) TOBACCO—			
Tobacco (cigar and pipe) in leaf	20	18	18

PRIMARY PRODUCTS AND MANUFACTURES—*continued.*CHELMSFORD SHIELD—*continued.*

	Possible Points.	West Moreton.	Wide Bay.
(10) HAY, CHAFF, &C.—			
Oaten, wheaten, lucerne, and other hay	30	22	18
Grassos and their seeds	10	8	7
Oaten, wheaten, lucerne, and other chaffs	50	41	32
Ensilage and other prepared cattle fodder	20	16	12
Sorghum and millets, in stalk	10	9	8
Commercial fibres (raw and manufactured)	10	8	5
Pumpkins and other green fodder	10	9½	7
Broom millet, ready for manufacture	10	6½	8
Farm seeds, including canary seed	13	9	11
	163	129	108
(11) WOOL, &C.—			
Scoured wool	40	37	35
Greasy wool	60	56	53
Mohair	10	8	8
	110	101	96
(12) ENLARGED PHOTOGRAPHS—			
A maximum of 5 points will be awarded for enlarged photographs of district scenery and local-bred live stock	5	5	1
(13) EFFECTIVE ARRANGEMENT—			
Comprehensiveness of view	30	28	27
Arrangement of sectional stands	20	20	17
Effective ticketing	10	10	10
General finish	20	19	17
	80	77	71
Grand Total	1,558	1,222	1,166½

PRIMARY PRODUCTS ONLY.

In the primary products only competition the contest was particularly keen, and the final result was a triumph for the Northern Darling Downs, with a grand total of 854 points. The Kilcoy district was second with a grand total of 829 points. The contest for third place was very close, Gympie securing the honour with 774 points, and Kingaroy fourth with 772 points. Nanango did well, and secured a grand total of 744½ points. In allowing the incomplete exhibit from Mundubbera to take its place in the competition, the Council paid tribute to the courage of those responsible for getting what was shown together, and it was indeed unfortunate that the rest of the exhibit was not produced. However, the exhibit secured 317 points, and will participate in the prize money. In one section—wool, &c.—Northern Darling Downs only dropped two points, securing a total for wool, &c., of 108 out of a possible 110. That exhibit also scored heavily for wheat, and perhaps the most interesting section was dairy produce; and here Gympie and Nanango were

equal, each with 152. Northern Darling Downs were next with 151. Then followed Kileoy with 150, and Kingaroy 148—a very close contest. Appended are the awards:—

PRIMARY PRODUCTS ONLY—*continued.*

	Possible Points.	Mundubbera.	Gympie.	Kileoy.	Kingaroy.	Nanango.	Northern Darling Downs.
(1) DAIRY PRODUCE—							
Butter, 1 box, 56 lb.	90	..	86	84	86	87	88
Cheese, not less than 1 cwt. . . .	60	..	54	51	50	52	53
Eggs, suitable for domestic use ; 1 doz. of each variety	20	6	12	15	12	13	10
	170	6	152	150	148	152	151
(2) FOODS—							
Hams, bacon, rolled and smoked beef and mutton	50	..	15	20	25	27	24
Fish (smoked)	10	..	4	2	..	..	4
Lard, tallow, and animal oils . .	20	1	9	10	10	12	9
Honey and its by-products . . .	20	5	9	16	8	7	14
Confectionery (home-made) . . .	10	5	10	9	9	7	10
Biscuits, bread, cakes, and scones (home-made)	10	3	8	8	7	8	5
	120	14	55	65	57	61	66
(3) FRUITS, VEGETABLES, AND ROOTS—FRESH AND PRE- SERVED—							
Fresh fruits—all kinds	60	12	42	45	18	20	22
Preserved fruit and jams, &c., prepared by farmer	20	2	15	20	10	18	10
Dried fruit, prepared by farmer . .	5	..	3	4	3	4	3
Fresh vegetables—all kinds, in- cluding table pumpkins, but excluding potatoes	25	8	16	12	6	10	10
Preserved and dried vegetables, pickles, sauces, &c.	10	..	7	9	5	8	7
Potatoes, English and sweet . . .	40	16	38	35	22	32	20
Roots—all kinds—and their products, arrowroot, cassava meal, &c.; samples not less than 1 lb.	14	10	12	12	7	8	6
Cocoanuts, peanuts, and other nuts	6	..	5	4	5	5	2
Vegetable seeds	10	3	7	5	7	8	6
	190	51	145	146	83	113	86
(4) GRAIN, &C.—							
Wheat	50	..	5	5	20	30	40
Flour, bran, pollard, macaroni, and meals prepared therefrom . .	10	..	1	1	1	6	7½
Maize	50	20	43	43	46	44	38
Maizena, meals, starch, glucose, and cornflour	10	2	8	5	6	6	1
Oats, rye, rice, barley, malt, pearl barley, and their meals . .	30	2	4	22	20	20	27
	150	24	61	76	93	106	113½

PRIMARY PRODUCTS ONLY—continued.

	Possible Points.	Mundubbera.	Gympie.	Kilcoy.	Kingaroy.	Nanango.	Northern Darling Downs.
(5) WOODS—							
Dressed, undressed, and polished; one face to be dressed, and half of it polished; back to be rough; samples to measure not less than 12 x 6 x 1 inch thick	25	12	21	23	19	18	21
Wattle bark	15	12	10	11	12	11	12
	40	24	31	34	31	29	33
(6) HIDES (1) AND HOME-PRESERVED SKINS FOR DOMESTIC USE—							
Must be free from offensive smell	15	3	4	10	11	10	13
(7) TROPICAL PRODUCTS—							
Sugar-cane	60	5	40	15	4	3	2
Coffee, tea, and spices	10	..	9	5	6	..	8
Cotton (raw) and by-products	30	15	18	24	15	24	26
	100	20	67	44	25	27	36
(8) MINERALS—							
Gold, silver, copper, and precious stones	25	7	16	12	11	12	11
Coal, iron, and other minerals, and salt	30	5	9	7	12	7	16
	55	12	25	19	22	19	27
(9) TOBACCO—							
Tobacco (cigar and pipe) in leaf	20	10	..	10	12	..	18
(10) HAY, CHAFF, &C.—							
Lucerno, oaten, wheaten, and other hay	30	6	6	21	21	9	22
Grasses and their seeds	10	4	5½	6	7	5½	4
Oaten, wheaten, lucerno, and other chaffs	50	15	21	20	36	30	42
Ensilago and other prepared cattle fodder	20	4	4	1	1	9	12
Sorghums and millets, in stalk	10	3	7	8	8	8	8½
Commercial fibres	10	3	8	2	5	..	5
Pumpkins and other green fodder	10	5	8½	8	7	7	7
Hemp and flax	10	..	5	2	4	1	4
Broom millet, ready for manufacture	10	..	6	4	8	9	8
Farm seeds, including canary seeds	13	5	6	8	8	9	6
	173	45	77	88	105	87½	118½

PRIMARY PRODUCTS ONLY—*continued.*

	Possible Points.	Mundubbera.	Gympie.	Kilcoy.	Kingaroy.	Nanango.	Northern Darling Downs.
(11) WOOL, &c.—							
Scoured wool	40	35	..	32	35	..	39
Greasy wool	60	44	48	40	52	49	59
Mohair	10	8	8	6	7	9	10
	110	87	57	78	94	58	108
(12) ENLARGED PHOTOGRAPHS—							
A maximum of 5 points will be awarded for enlarged photographs of district scenery and local-bred live stock ..							
	5	..	5	2	2	2	2
(13) LADIES AND SCHOOLS' WORK AND FINE ARTS—							
Needlework, knitting	25	..	18	25	20	14	14
School needlework, by pupils of schools in the district ..	5	..	3	5	4	2	2
Fine arts	5	..	3	1	5	2	4
School work, maps, writing, &c., by pupils of schools in the district	10	4	1	8	6	7	6
	45	4	25	39	35	25	26
(14) EFFECTIVE ARRANGEMENT—							
Comprehensiveness of view ..	30	10	29	28	22	24	22
Arrangement of sectional stands	20	4	15	19	10	12	10
Effective ticketing	10	1	9	10	8	7	7
General finish	20	2	18	19	14	12	17
	80	17	71	76	54	55	56
Grand Total	1,273	317	774	829	772	744½	854

ONE-FARM COMPETITION.

In the One Farm Exhibits, K. Haag (Teviotville) won with 471½ points, A. Lofgren (Coalfields, Ipswich) was second with 452½, and L. Christensen (Pierce's Creek, Crow's Nest) third with 404½ points. The other three also gained good points. Details:—

COLLECTION OF FARM PRODUCE, FOODS FOR CONSUMPTION, &c.

	Possible Points.	W. Brumpton (Amby).	L. Christensen (Crow's Nest).	K. Haag (Teviotville).	W. Horswood (Chinchilla).	G. C. Klump (Mt. Gravatt).	A. Lofgren (Ipswich).
(1) DAIRY PRODUCE—							
Butter, 6 lb.	25	21	20	23	20	23	20
Cheese, 1 large or 2 small, home-made	20	16	2	17	19	13	17
Eggs, suitable for domestic use; 1 doz. each variety	5	3	3	3	3½	3	4
	50	40	32	42	42½	39	42
(2) FOODS—							
Hams (15 lb.), bacon (15 lb.), home cured	20	15	14	18	13	8	10
Corned, smoked, and spiced beef and mutton, 10 lb.	10	8	6	6	5	6	4
Honey, 12 lb.	10	6	6	8	5	8	9
Beeswax, 6 lb.	10	4	3	3	3	5	4
Bread, 2 loaves; scones, 1 doz.	5	5	4	5	4	5	5
Confectionery and sweets, 3 lb.	5	5	4	5	5	5	5
Cakes and biscuits	5	3	4	5	4	4	5
Lard, tallow, animal oils	5	3	4	4	4	4	4
	65	49	45	54	43	45	46
(3) FRUITS, VEGETABLES, AND ROOTS—FRESH AND PRE-SERVED—							
Fresh fruits—all kinds	25	2	6	14	8	12	22
Dried fruits	10	8	2	9	8	8	2
Preserved fruits and jams	15	12	10	3	10	12	12
Fresh vegetables	15	8	5	11	8	12	14
Pickles, sauces, &c.	15	12	9	14	9	12	11
Potatoes, not less than 28 lb. (or collection), and roots	25	16	24	23	10	21	22
Table pumpkins, squashes, and marrows, 56 lb.	10	7	7	9½	6	5	9
Cocoanuts and nuts	3	2	2	2	2	2	2
Vegetable and garden seeds	5	3½	4	4	3	3	3
Arrowroot, 10 lb.	5	2	4	3	2	4	3
Sugar beet, 3 lb.	5	3	1	3	..	2	3
Cassava, 3 lb.	5	..	..	3	..	2½	3
Ginger, 3 lb.	5	..	3	..	..	4	4
	143	75½	77	108½	66	99½	107

ONE-FARM COMPETITION—*continued.*

	Possible Points.	W. Brumpton (Amby).	L. Christensen (Crow's Nest).	K. Haag (Teviotville).	W. Horswood (Chinchilla).	G. C. Klump (Mt. Gravatt).	A. J. Egan (P-swich).
(4) GRAIN, &C.—							
Wheat	25	20	17	14	12	16	12
Maize	25	9	20	22	15	12	17
Barley, oats, rye, and rice ..	20	8	15	15	7	8	16
	70	37	52	51	34	36	45
(5) TROPICAL PRODUCTS—							
Sugar-cane, 24 stalks, or 1 stool	30	..	12	16	..	18	24
Cotton in seed, 10 lb., long staple.. .. .	10	6	8	6	8	5	6
Coffee, 10 lb. .. .	5	..	4	..	..	4	4
	45	6	24	22	8	27	34
(6) TOBACCO—							
Tobacco-leaf, dried, 5 lb. ..	10	8	8	..	..	8	5
(7) HAY, CHAFF, &C.—							
Hay—oaten, wheaten, lucerne, and other varieties ..	20	14	12	18	12	10	16
Grasses and their seeds, including canary	10	5	7	8	6	6	7
Chaff—oaten, wheaten, lucerne, and other varieties ..	20	11	16	18	14	15	15
Ensilage, any form	15	5	10	13	8	2	12
Cattle fodder (pumpkins and green fodder)	15	8	10	11	10	8	11
Sorghum and millet, in stalk..	10	7	6	7	7	6	6
Broom millet, 10 lb.	10	8	9	7	8	6	6
Cowpea seed, 7 lb.	7	4	6	5	3	2	4
Flax, 3 lb.	5	..	4	3	..	0½	3
Hemp, 5 lb.	5	..	4	4	..	3	3
	117	62	84	94	68	58½	83
(8) WOOL—							
Greasy, 5 fleeces	20	20	15	16	15	..	17
Mohair	5	..	4	4	3	..	5
	25	20	19	20	18	..	22
(9) DRINKS, &C.—							
Temperance drinks, 6 bottles	10	5	3	8	4	5	5
(10) WOMEN'S AND CHILDREN'S WORK—							
Needlework, knitting	10	9	7	7	7	10	5
Fine arts	5	..	2	3	..	2	3
Fancy work	15	12	13	14	10	15	12
School work, maps, writing, &c.	5	1	2	..	4	3	..
School needlework	5	..	..	..	3	2	2
	40	22	24	24	24	32	22

ONE-FARM COMPETITION—*continued.*

	Possible Points.	W. Brumpton (Amby).	L. Christensen (Crow's Nest).	K. Haag (Teviotville).	W. Horswood (Chinchilla).	G. C. Klumpp (Mt. Gravatt).	A. Iofgren (Ipswich).
(11) MISCELLANEOUS ARTICLES OF COMMERICAL VALUE ..	5	4	4	4	4	3	2½
(12) PLANTS AND FLOWERS IN POTS	5	1	..	5	2	3	2½
(13) TIME AND LABOUR SAVING USEFUL ARTICLES MADE ON THE FARM	10	4	7	5	5	4	3½
(14) EFFECTIVE ARRANGEMENT OF EXHIBITS —							
Comprehensiveness of view ..	10	7	9	10	9	8	10
Arrangement of stands ..	10	7	6	9	6	7	10
Effective ticketing ..	5	4	3½	5	4½	4½	4
General finish	10	6	7	10	9	7	10
	35	24	25½	34	28½	26½	34
Grand Total	630	357½	404½	471½	347	386½	452½

FARM PRODUCE.

Cereals.

(Judges, Messrs. H. C. Quodling and C. McKeon.)

Maize, shelled, large yellow, Hawkesbury Champion or Golden King: H. Franke 1, J. T. Biggs 2, H. Dippel 3. Improved Yellow Dent: H. Franke 1, C. Behrendorff 2, W. Neal, jun., 3. Horse Tooth: J. A. Nystrom 1, A. Franke 2. Yellow Dent, any other variety: W. Neal, jun., 1, J. A. Nystrom 2, T. Fisher 3. Medium yellow, Golden Beauty: K. Haag 1, J. Davis 2, T. Fisher 3. Yellow Dent: H. Franke 1, R. V. McLuskie 2. Yellow Peg, tooth type: H. Dippel 1, H. Franke 2 and 3. Small yellow, Early Leaming: M. Ryan 1, A. J. Mogridge 2, H. Franke 3. Reid's, Funk's, or James's Yellow Dent: H. Franke. Early Yellow Dent: C. S. Huxley 1, H. Franke 2, K. Haag 3. So-called 90 Day, small yellow dent: M. Ryan 1, H. Franke 2. Small yellow flint: T. Fisher 1, H. Franke 2 and 3. White varieties.—Large white, except Hickory King: W. Neal, jun., 1, H. Dippel 2. Hickory King: A. Dippel 1, J. T. Biggs 2. Boone County, white: A. Loweke 1, H. Franke 2, H. Dippel 3. Brazilian white: C. E. Behrendorff. Red varieties.—Red Hogan: H. Dippel 1, C. Behrendorff 2, H. Franke 3. Sydney Red: H. Franke 1, J. T. Biggs 2. Red butcher or other distinct red type: A. Dippel. Small early red: H. Franke 1, J. A. Nystrom 2, J. Donges 3. Sweet and pop corn.—Sweet corn: H. Franke. Pop corn: E. Dearling 1, H. Franke 2, H. Dippel 3. Maize ears.—Large yellow: W. Neal, jun., 1, W. Sharler 2, J. P. Mooney 3. Medium yellow: R. V. McLuskie 1, H. Franke 2, K. Haag 3. Any other white variety: J. T. Biggs 1, C. Behrendorff 2. Red: H. Dippel 1, A. Dippel 2. Red, small grain: J. T. Biggs 1, J. A. Nystrom 2. Sweet corn: H. Franke. Pop corn: H. Franke 1, E. Dearling 2. Wheat.—Medium strong flour: J. C. Jensen 1 and 2. Oats and

rye.—Algerian or Sunrisc Oats: J. Berney 1, K. Haag 2. Rye: J. Berney. Hay.—Lucerne, best dry: J. Campbell 1, C. Behrenderff 2. Soudan grass: H. Franke. Millet or panicum: H. Franke. Algerian oaten: F. W. Sprenger 1, H. W. Berlin, 2. Tartarian oaten: H. W. Berlin 1 and 2. Wheaten: J. Logan 1, H. W. Berlin 2. Chaff—Lucerne: F. W. Sprenger 1, H. W. Berlin 2. Oaten: K. Haag 1, F. W. Sprenger 2. Wheaten: S. Hando 1, H. W. Berlin 2. Mixed, oaten and lucerne: O. C. Granzien, sen., 1, F. W. Sprenger 2. Wheaten and lucerne: H. W. Berlin 1, J. W. Campbell 2. Panicum and lucerne: J. Campbell 1, H. W. Berlin 2. Any other mixture: H. W. Berlin 1, J. Campbell 2. Soudan grass: H. Franke 1, O. C. Granzien, sen., 2. Millet or panicum: H. W. Berlin 1 and 2. Grass hay: H. W. Berlin 1, H. Franke 2. Wheaten straw: K. Haag 1, J. Donges 2. Oaten straw: J. Donges. Straw: J. Campbell 1, H. W. Berlin 2. Epsilage.—Whole stalked: Miss Caswell 1, M. Porter and Sons 2.

AGRICULTURAL AND MARKET GARDEN SEEDS.

Cream standard, or dwarf milo: H. Dippel. Red Kassir corn: E. Dearling 1, H. Franke 2. Sorghum: H. Franke. Saccaline: H. W. Berlin 1, H. Franke 2. Planter's Friend: H. Dippel 1, C. Behrendorff 2. Amber cane: K. Haag 1, H. Franke 2. Broom millet.—Seed, 30 lb.: H. Franke. Prime hurl: H. Franke. Panicum and fodder millets.—Liberty: K. Haag 1, J. Logan 2. Japanese: K. Haag 1, H. W. Berlin 2. White panicum: H. W. Berlin. Pasture grass seeds.—Prairie grass: E. Dearling 1, H. W. Berlin 2. Beans and peas.—Canadian Wonder: A. J. Mogridge. Haricot: A. Wyllie. Lima: A. Wyllie. Cow-peas, clay coloured: T. Fisher 1, K. Haag 2. Any other variety: K. Haag. Miscellaneous.—Peanuts, large podded: K. Haag 1, H. Franke 2. Small podded: W. Neal, jun., 1, K. Haag 2. Giant Russian sunflower: C. S. Huxley. White-seeded French: K. Haag.

ROOTS AND VEGETABLES.

Potatoes.—Guyra Blue: E. Pickering 1, H. Franke 2. Manhattan: J. T. Biggs. Brownell, any other variety than Satisfaction: H. Franke 1 and 2. Satisfaction: H. Franke 1 and 2. White Carmen: T. A. Flood 1, J. Sinnamon 2, J. T. Biggs 3. Scottish Triumph: G. W. Armstrong. Up-to-date: J. T. Biggs 1, H. Franke 2. Collection of English varieties: H. Franke 1, J. T. Biggs 2. Other roots and vegetables.—Pumpkins, Crown: J. Logan 1, J. Campbell 2. Ironbark: J. Logan 1, J. T. Biggs 2. Silver Nugget: J. Logan 1, H. W. Berlin 2. Triamble: J. Logan 1, H. W. Berlin 2. Button: H. W. Berlin 1, J. Logan 2. Cattle: J. T. Biggs. Melons.—Pie: J. Seeleither. Arrowroot: J. C. Seeleither. Mangold wurzel.—Long red: H. W. Berlin 1 and 2. Globe, red: H. W. Berlin 1, H. Franke 2. Long yellow: H. W. Berlin 1, H. Franke 2. Globe yellow: H. W. Berlin 1 and 2. Swedes.—Purple top: A. Loweke.

CHAMPIONS.

Maize, shelled: M. Ryan. Reserve champion: K. Haag. Maize, ears: W. Neal, jun. Grand Champion, wheat: J. Berney, W. Geitz Bros., in second and third places. Blue potato: J. T. Biggs. Brownell: H. Franke. White potato: T. A. Flood.

TROPICAL PRODUCTS.

(Judge, Mr. H. T. Easterby.)

Sugar-cane, 16 months and under, grown in red soil: R. Williamson 1 and 2. Other than red soil: H. Meirs 1, W. G. Cocking 2. Standover, five canes, with tops: H. Miers. Collection: H. Miers 1, B. Leach 2. One stool, 16 months and under: H. Miers. Standover, one stool: H. Miers. Highest C.C.S., six canes, with tops: R. Williamson 2. Badila cane, over 18 months: H. Miers. Sugar cane, D. 1135: H. Miers. 1900 seedlings: B. Leach 1, R. Williamson 2. Any other milling variety: H. Miers. Any variety of Queensland or Hambledon seedlings: W. J. Parker 1, A. W. Macpherson 2.

BUTTER FOR EXPORT.

Export butter 30 days' storage, salted. One box, 56 lb., suitable for export.

	Flavour.	Texture.	Colour	Saltng.	Packing.	Total.
Possible points	65	20	7	4	4	100
Nanango Co-operative Dairy Co., Ltd. ..	60	20	7	4	4	95
Queensland Farmers' Co-operative Co., Ltd., Grantham	60	20	6 $\frac{3}{4}$	4	4	94 $\frac{3}{4}$
Caboolture Co-operative Dairy Co., Ltd. .	59	20	7	4	4	94
Oakey District Co-operative Butter Co., Ltd.	59	20	6 $\frac{1}{4}$	4	4	93 $\frac{3}{4}$
Maryborough Co-operative Dairy Co., Ltd., Kingaroy	59	19 $\frac{3}{4}$	7	4	3 $\frac{3}{4}$	93 $\frac{1}{2}$
Queensland Farmers' Co-operative Co., Ltd., Laidley	57	20	7	4	4	92
Downs Co-operative Dairy Co., Ltd., Clifton	58	19 $\frac{3}{4}$	6 $\frac{1}{4}$	4	3 $\frac{3}{4}$	91 $\frac{3}{4}$
Caboolture Co-operative Dairy Co., Ltd., Eumundi	57	19 $\frac{3}{4}$	6 $\frac{1}{2}$	4	4	91 $\frac{1}{2}$
Warwick Butter and Dairy Co., Ltd., Texas	56 $\frac{1}{2}$	20	7	4	3 $\frac{3}{4}$	91 $\frac{1}{4}$
Esk Co-operative Dairy Co., Ltd.	56 $\frac{1}{2}$	20	6 $\frac{1}{2}$	4	4	91
Warwick Butter and Dairy Co., Ltd., Goondiwindi	56	20	7	4	4	91
Caboolture Co-operative Dairy Co., Ltd., Pomona	56	19 $\frac{3}{4}$	7	4	4	90 $\frac{3}{4}$
Maryborough Co-operative Dairy Co., Ltd., Mundubbera	56 $\frac{1}{2}$	19 $\frac{3}{4}$	6	4	3 $\frac{3}{4}$	90
Terror's Creek and Samsonvale Co-operative Dairy Co., Ltd., Dayboro'	56 $\frac{1}{2}$	19 $\frac{1}{4}$	6 $\frac{1}{2}$	4	3 $\frac{3}{4}$	90
Warwick Butter and Dairy Co., Ltd., Allora	56 $\frac{1}{2}$	19 $\frac{1}{4}$	6 $\frac{1}{2}$	4	3 $\frac{3}{4}$	89 $\frac{1}{2}$
Downs Co-operative Dairy Co., Ltd., Crow's Nest	56	19 $\frac{1}{4}$	6 $\frac{1}{2}$	4	3 $\frac{1}{2}$	89 $\frac{1}{4}$

Export butter, 8 weeks' storage, unsalted. One box 56 lb., suitable for export.

	Flavour.	Texture.	Colour.	Packing.	5 points additional.	Total.
Possible points	65	20	7	4	5	101
Oakey District Co-operative Butter Co., Ltd.	60	20	7	4	5	96
Queensland Farmers' Co-operative Co., Ltd., Boonah	59 $\frac{1}{2}$	20	7	4	5	95 $\frac{1}{2}$
Warwick Butter and Dairy Co., Ltd., Allora	59	20	7	4	5	95
Caboolture Co-operative Dairy Co., Ltd. .	59	20	6 $\frac{3}{4}$	4	5	94 $\frac{3}{4}$
Warwick Butter and Dairy Co., Ltd., Texas	58 $\frac{1}{2}$	20	7	4	5	94 $\frac{1}{2}$
Maryborough Co-operative Dairy Co., Ltd., Kingaroy	58 $\frac{3}{4}$	20	6 $\frac{3}{4}$	4	5	94 $\frac{1}{2}$
Warwick Butter and Dairy Co., Ltd., Goondiwindi	58 $\frac{1}{2}$	20	6 $\frac{3}{4}$	4	5	94 $\frac{1}{4}$
Queensland Farmers' Co-operative Co., Ltd., Grantham	58	20	7	4	5	94
Queensland Farmers' Co-operative Co., Ltd., Laidley	58	20	7	4	5	94

BUTTER FOR EXPORT—*continued*.Export butter, 8 weeks' storage, unsalted. One box 56 lb., suitable for export—*contd.*

	Flavour.	Texture.	Colour.	Packing.	5 points additional.	Total.
Possible points	65	20	7	4	5	101
Esk Co-operative Dairy Co., Ltd. . . .	58	20	6 $\frac{3}{4}$	4	5	93 $\frac{3}{4}$
Logan and Albert Co-operative Dairy Co., Ltd., Beaudesert	58 $\frac{1}{2}$	20	6 $\frac{1}{2}$	3 $\frac{3}{4}$	5	93 $\frac{3}{4}$
Nanango Co-operative Dairy Co., Ltd. . .	58	20	6 $\frac{1}{2}$	4	5	93 $\frac{1}{2}$
Terror's Creek and Samsonvale Co-operative Dairy Co., Ltd., Dayboro'	58	19 $\frac{3}{4}$	6 $\frac{1}{2}$	4	5	93 $\frac{1}{2}$
Downs Co-operative Dairy Co., Ltd., Too-woomba	57	20	7	4	5	93
Queensland Farmers' Co-operative Co., Ltd., Booval	57	20	7	4	5	93
Maryborough Co-operative Dairy Co., Ltd., Biggenden	57	20	7	3 $\frac{1}{2}$	5	92 $\frac{1}{2}$
Downs Co-operative Dairy Co., Ltd., Crow's Nest	57	19 $\frac{3}{4}$	6 $\frac{1}{4}$	4	5	92
Maryborough Co-operative Dairy Co., Ltd., Maryborough	56 $\frac{1}{2}$	20	6 $\frac{1}{4}$	4	5	91 $\frac{3}{4}$
Downs Co-operative Dairy Co., Ltd., Clifton	56 $\frac{1}{2}$	19 $\frac{3}{4}$	6 $\frac{1}{4}$	4	5	91 $\frac{1}{2}$
Gayndah Co-operative Dairy Co., Ltd. . .	55 $\frac{1}{2}$	20	6 $\frac{1}{2}$	4	5	91 $\frac{1}{4}$
Maryborough Co-operative Dairy Co., Ltd., Mundubbera	54	20	6 $\frac{1}{4}$	4	5	89 $\frac{3}{4}$

Export butter, 8 weeks' storage, salted. One box 56 lb., suitable for export. No preservative other than salt permitted in manufacture.

	Flavour.	Texture.	Colour.	Salting.	Packing.	Total.
Possible points	65	20	7	4	4	100
Queensland Farmers' Co-operative Co., Ltd., Grantham	60 $\frac{1}{2}$	20	7	4	4	95 $\frac{1}{2}$
Nanango Co-operative Dairy Co., Ltd. . .	61	19 $\frac{1}{2}$	6 $\frac{1}{2}$	4	4	95
Queensland Farmers' Co-operative Co., Ltd., Booval	59 $\frac{1}{2}$	20	7	4	4	94 $\frac{1}{2}$
Warwick Butter and Dairy Co., Ltd., Goondiwindi	57	20	6 $\frac{1}{4}$	4	3 $\frac{1}{2}$	94 $\frac{1}{4}$
Oakey District Co-operative Butter Co., Ltd.	59	20	7	4	4	94
Queensland Farmers' Co-operative Co., Ltd., Boonah	59	20	7	4	4	94
Maryborough Co-operative Dairy Co., Ltd., Mundubbera	59	20	6 $\frac{3}{4}$	4	4	93 $\frac{3}{4}$
Gayndah Co-operative Dairy Co., Ltd. . .	58 $\frac{1}{2}$	20	6 $\frac{3}{4}$	4	4	93 $\frac{1}{4}$
Maryborough Co-operative Dairy Co., Ltd., Maryborough	58	20	6 $\frac{1}{2}$	4	4	92 $\frac{1}{2}$
Esk Co-operative Dairy Co., Ltd.	57	20	7	4	4	92
Maryborough Co-operative Dairy Co., Ltd., Biggenden	58	19 $\frac{1}{2}$	6 $\frac{1}{2}$	4	4	92

BUTTER FOR EXPORT—*continued.*

Export Butter, 8 weeks' storage, salted. One box, 56 lb., suitable for export. No preservative either than salt permitted in manufacture—*continued.*

	Flavour.	Texture.	Colour.	Salting.	Packing.	Total.
Queensland Farmers' Co-operative Co., Ltd., Laidley	57	20	7	4	4	92
Caboolture Co-operative Dairy Co., Ltd. . .	57	19 $\frac{3}{4}$	6 $\frac{3}{4}$	4	4	91 $\frac{1}{2}$
Warwick Butter and Dairy Co., Ltd., Texas	58	19 $\frac{3}{4}$	6 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	91 $\frac{1}{4}$
Downs Co-operative Dairy Co., Ltd., Clifton	56	19 $\frac{3}{4}$	6 $\frac{1}{2}$	4	4	90 $\frac{1}{2}$
Downs Co-operative Dairy Co., Ltd., Toowoomba	56 $\frac{1}{2}$	19 $\frac{3}{4}$	6	4	4	90 $\frac{1}{4}$
Downs Co-operative Dairy Co., Ltd., Crow's Nest	55	20	7	4	4	90
Logan and Albert Co-operative Dairy Co., Ltd., Beaudesert	56	19 $\frac{3}{4}$	6 $\frac{1}{4}$	4	4	90
Warwick Butter and Dairy Co., Ltd., Allora	56	19 $\frac{3}{4}$	6 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	89 $\frac{1}{2}$
Terror's Creek and Samsonvale Co-operative Dairy Co., Ltd., Dayboro'	56	19 $\frac{1}{2}$	6 $\frac{1}{2}$	3 $\frac{3}{4}$	3 $\frac{1}{2}$	89 $\frac{1}{4}$

Export butter, eight weeks' storage, salted. One box, 56lb., manufactured in Queensland from pasteurised cream, suitable for table use in Britain.

	Flavour.	Texture.	Colour.	Salting.	Packing.	Total.
Possible points	65	20	7	4	4	100
Oakey District Co-operative Butter Co., Ltd.	61	20	7	4	4	96
Nanango Co-operative Dairy Co., Ltd. . .	61	20	6 $\frac{1}{2}$	4	4	95 $\frac{1}{2}$
Maryborough Co-operative Dairy Co., Ltd., Mundubbera	60	20	7	4	4	95
Esk Co-operative Dairy Co., Ltd. . .	59 $\frac{1}{2}$	20	7	4	4	94 $\frac{1}{2}$
Queensland Farmers' Co-operative Co., Ltd., Grantham	60	20	6 $\frac{1}{2}$	4	4	94 $\frac{1}{2}$
Logan and Albert Co-operative Dairy Co., Ltd., Beaudesert	60	19 $\frac{3}{4}$	6 $\frac{1}{2}$	4	4	94 $\frac{1}{4}$
Maryborough Co-operative Dairy Co., Ltd., Biggenden	60	19 $\frac{3}{4}$	6 $\frac{3}{4}$	4	3 $\frac{3}{4}$	94 $\frac{1}{4}$
Gayndah Co-operative Dairy Co., Ltd. . .	59 $\frac{1}{2}$	20	6 $\frac{3}{4}$	4	3 $\frac{3}{4}$	94
Maryborough Co-operative Dairy Co., Ltd., Kingaroy	59 $\frac{1}{2}$	20	6 $\frac{3}{4}$	3 $\frac{3}{4}$	4	94
Queensland Farmers' Co-operative Co., Ltd., Laidley	59 $\frac{1}{2}$	20	7	3 $\frac{1}{2}$	4	94
Queensland Farmers' Co-operative Co., Ltd., Booval	59	20	7	3 $\frac{3}{4}$	4	93 $\frac{3}{4}$
Caboolture Co-operative Dairy Co., Ltd. . .	59	20	7	3 $\frac{1}{2}$	4	93 $\frac{1}{2}$
Downs Co-operative Dairy Co., Ltd., Dalby	59	20	7	3 $\frac{1}{2}$	4	93 $\frac{1}{2}$
Queensland Farmers' Co-operative Co., Ltd., Boonah	59	20	7	3 $\frac{1}{2}$	4	93 $\frac{1}{2}$
Maryborough Co-operative Dairy Co., Ltd., Maryborough	59	20	6 $\frac{1}{2}$	4	3 $\frac{3}{4}$	93 $\frac{1}{4}$
Downs Co-operative Dairy Co., Ltd., Clifton	58 $\frac{1}{2}$	20	6 $\frac{1}{2}$	4	4	93
Warwick Butter and Dairy Co., Ltd., Goondiwindi	58	20	7	4	4	93
Warwick Butter and Dairy Co., Ltd., Texas	58	20	7	4	4	93

BUTTER FOR EXPORT—*continued.*

	Flavour.	Texture.	Colour.	Salting.	Packing.	Total.
Possible points	65	20	7	4	4	100
Warwick Butter and Dairy Co., Ltd., Allora	56½	20	7	4	4	91½
Downs Co-operative Dairy Co., Ltd., Toowoomba	57	19½	6½	3¾	4	90¾
Terror's Creek and Samsonvale Co-operative Dairy Co., Ltd., Dayboro'	56½	19½	6½	3½	4	90

BUTTER AWARDS.

FRESH BUTTER FOR LOCAL CONSUMPTION. ONE BOX, 56 LB., FACTORY MADE.

	Flavour.	Texture.	Colour.	Salting.	Packing.	Total.
Possible points	65	20	7	4	4	100
Oakoy District Co-operative Butter Co., Ltd.	61	20	7	4	3¾	95¾
Queensland Farmers' Co-operative Co., Ltd., Laidley	60½	20	6¾	4	4	95¼
Caboolture Co-operative Dairy Co., Ltd.	60	20	7	4	4	95
Nanango Co-operative Dairy Co., Ltd. ..	60	20	6½	4	4	94½
Queensland Farmers' Co-operative Co., Ltd., Boonah	59½	20	7	4	4	94½
Wide Bay Co-operative Dairy Co., Ltd., Cooroy	59½	20	7	4	4	94½
Gayndah Co-operative Dairy Co., Ltd. ..	59½	20	6½	4	4	94
Queensland Farmers' Co-operative Co., Ltd., Booval	59	20	7	4	4	94
Queensland Farmers' Co-operative Co., Ltd., Grantham	59	20	6¾	4	4	93¾
Maryborough Co-operative Dairy Co., Ltd., Maryborough	59½	20	6½	4	2½	93½
Warwick Butter and Dairy Co., Ltd., Goondiwindi	59	19½	7	4	4	93½
Caboolture Co-operative Dairy Co., Eumundi	58½	20	6¾	4	4	93¼
Downs Co-operative Dairy Co., Ltd., Crow's Nest	58½	19½	7	4	4	93
Warwick Butter and Dairy Co., Ltd., Texas	59	19½	7	4	3½	93
Queensland Agricultural High School and College	58	20	6¾	4	4	92¾
Logan and Albert Co-operative Dairy Co., Ltd., Beaudesert	58½	19¼	6½	4	3½	92¼
Maryborough Co-operative Dairy Co., Ltd., Biggenden	58½	19¾	6½	4	3½	92¼
Caboolture Co-operative Dairy Co., Ltd., Pomona	58	19½	6½	4	4	92
Warwick Butter and Dairy Co., Ltd., Allora	58½	19½	6¾	4	3¾	92
Esk Co-operative Dairy Co., Ltd. ..	57	19¼	6¾	4	4	91
Maryborough Co-operative Dairy Co., Ltd., Kingaroy	58	19¼	6½	3¾	3½	91
Downs Co-operative Dairy Co., Ltd., Clifton	57	19½	6½	4	3½	90½
Maryborough Co-operative Dairy Co., Ltd., Mundubbera	57	19½	6¼	4	3¾	90½
Terror's Creek and Samsonvale Co-operative Dairy Co., Ltd., Dayboro' ..	56½	19¼	6½	4	3½	89¾

BUTTER AWARDS—continued.

AGGREGATE SPECIAL FOR FACTORY SECURING THE GREATEST NUMBER OF POINTS IN ALL CLASSES FOR BUTTER.

	Thirty Days' Storage (Salted).	Eight Weeks' Storage (Unsalted).	Eight Weeks' Storage (Salted, No Pre- servative).	Eight Weeks' Storage (Salted, Pasteurised Cream).	Fresh.	Grand Aggregate.
Oakey District Co-operative Dairy Co., Ltd.	93 $\frac{3}{4}$	96	94	96	95 $\frac{3}{4}$	475 $\frac{1}{2}$
Nanango Co-operative Dairy Co., Ltd.	95	93 $\frac{1}{2}$	95	95 $\frac{1}{2}$	94 $\frac{1}{2}$	469 $\frac{1}{2}$
Caboolture Co-operative Dairy Co., Ltd.	94	94 $\frac{1}{2}$	91 $\frac{1}{2}$	93 $\frac{1}{2}$	95	468 $\frac{3}{4}$
Queensland Farmers' Co-operative Co., Ltd., Grantham	94 $\frac{3}{4}$	94	95 $\frac{1}{2}$	94 $\frac{1}{2}$	93 $\frac{3}{4}$	468 $\frac{1}{2}$
Queensland Farmers' Co-operative Co., Ltd., Booval	93	93	94 $\frac{1}{2}$	93 $\frac{3}{4}$	94	468 $\frac{1}{4}$
Others—						
Downs Co-operative Dairy Co., Ltd., Clifton	91 $\frac{1}{4}$	91 $\frac{1}{2}$	90 $\frac{1}{2}$	93	90 $\frac{1}{2}$	456 $\frac{3}{4}$
Esk Co-operative Dairy Co., Ltd.	91	93 $\frac{3}{4}$	92	94 $\frac{1}{2}$	91	462 $\frac{1}{2}$
Logan and Albert Co-operative Dairy Co., Ltd., Beaudesert	92 $\frac{1}{4}$	93 $\frac{3}{4}$	90	94 $\frac{1}{4}$	92 $\frac{1}{4}$	462 $\frac{1}{2}$
Maryborough Co-operative Dairy Co., Ltd., Mundubbera	90	89 $\frac{3}{4}$	93 $\frac{3}{4}$	95	90 $\frac{1}{2}$	459
Queensland Farmers' Co-operative Co., Ltd., Boonah	91 $\frac{1}{2}$	95 $\frac{1}{2}$	94	93 $\frac{1}{2}$	94 $\frac{1}{2}$	466
Queensland Farmers' Co-operative Co., Ltd., Laidley	92	94	92	94	95 $\frac{1}{4}$	467 $\frac{1}{4}$
Warwick Butter and Dairy Co., Ltd., Allora	89 $\frac{1}{2}$	95	89 $\frac{1}{2}$	91 $\frac{1}{2}$	92	457 $\frac{1}{2}$
Warwick Butter and Dairy Co., Ltd., Goondiwindi	91	94 $\frac{1}{4}$	94 $\frac{1}{4}$	93	93 $\frac{1}{2}$	466
Warwick Butter and Dairy Co., Ltd., Texas	91 $\frac{1}{4}$	94 $\frac{1}{2}$	91 $\frac{1}{2}$	93	93	463 $\frac{1}{4}$
Terror's Creek and Samsonvale Co-operative Dairy Co., Ltd., Dayboro'	90	93 $\frac{1}{2}$	89 $\frac{1}{4}$	90	89 $\frac{3}{4}$	452 $\frac{1}{2}$

CHEESE AWARDS.

Export cheese, white, pasteurised, suitable for English market; two, each 70 to 80 lb., stored for six weeks.

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
Pittsworth Dairy Co., Ltd., No. 1 Factory	47	25	14 $\frac{1}{2}$	10	96 $\frac{1}{2}$
Mount Tyson Co-operative Dairy Co., Ltd.	46	25	15	9 $\frac{1}{2}$	95 $\frac{1}{2}$
Biddeston Co-operative Dairy Co., Ltd.	44	24 $\frac{1}{2}$	15	9 $\frac{1}{2}$	93
Malling Co-operative Cheese Society, Ltd., Mac-lagan	44	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{1}{2}$	92 $\frac{1}{2}$
Southbrook Co-operative Dairy Co., Ltd.	44	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9	92
Nathan, Joseph, and Co. (Aust.), Ltd., Port Fairy, Victoria	44	24	14 $\frac{1}{2}$	9	92

CHEESE AWARDS—*continued.*

Export cheese, white, unpasteurised; suitable for the English market; two, each 70 to 80 lb., stored for six weeks.

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
Pittsworth Dairy Co., Ltd., No. 1 Factory ..	46 $\frac{1}{2}$	24 $\frac{3}{4}$	14 $\frac{3}{4}$	10	96
Pittsworth Dairy Co., Ltd., No. 5 Factory ..	46	24 $\frac{1}{2}$	14 $\frac{3}{4}$	10	95 $\frac{1}{4}$
Nathan, Joseph, and Co. (Aust.), Ltd., Port Fairy, Victoria	46	24 $\frac{1}{2}$	14 $\frac{3}{4}$	9 $\frac{3}{4}$	95
Malling Co-operative Cheese Society, Ltd., Mac-lagan	45	24 $\frac{1}{2}$	14 $\frac{3}{4}$	9	93 $\frac{1}{4}$
Downs Co-operative Dairy Co., Ltd., Westbrook	44 $\frac{1}{2}$	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{1}{2}$	93
Mount Tyson Farmers' Co-operative Dairy, Ltd.	42	24 $\frac{3}{4}$	15	9 $\frac{1}{2}$	91
Biddeston Co-operative Dairy Co., Ltd.	41 $\frac{1}{2}$	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{1}{2}$	90 $\frac{3}{4}$
Rodger's Creek Cheese Factory	41	24	14	9 $\frac{1}{2}$	88 $\frac{1}{2}$
Downs Co-operative Dairy Co., Ltd., Jondaryan	39	24 $\frac{1}{2}$	15	9 $\frac{1}{2}$	88
Downs Co-operative Dairy Co., Ltd., Gowrie Junction	40	24	14	9 $\frac{1}{2}$	87 $\frac{1}{2}$
Gayndah Dairy Co., Ltd., Byrnestown	38	23 $\frac{1}{2}$	14 $\frac{1}{2}$	8 $\frac{1}{2}$	84 $\frac{1}{2}$

Export cheese, coloured, pasteurised; suitable for the English market; two, each 70 to 80 lb., stored for six weeks.

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
Pittsworth Dairy Co., Ltd., No. 1 Factory ..	46 $\frac{1}{2}$	24 $\frac{1}{2}$	14 $\frac{3}{4}$	10	95 $\frac{3}{4}$
Cooranga North Co-operative Dairy Co., Ltd. ..	45 $\frac{1}{2}$	25	15	9 $\frac{3}{4}$	95 $\frac{1}{4}$
Malling Co-operative Cheese Co., Ltd., Mac-lagan	46	24 $\frac{1}{2}$	14 $\frac{3}{4}$	9 $\frac{1}{2}$	94 $\frac{3}{4}$
Mount Tyson Farmers' Co-operative Dairy Co., Ltd.	45	24 $\frac{1}{2}$	15	10	94 $\frac{1}{2}$
Pittsworth Dairy Co., Ltd., No. 2 Factory ..	46	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{1}{2}$	94 $\frac{1}{2}$
Biddeston Co-operative Dairy Co., Ltd. ..	45	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{1}{4}$	93 $\frac{3}{4}$
Southbrook Co-operative Dairy Co., Ltd. ..	43	25	14	9	91
Nathan, Joseph, and Co. (Aust.), Ltd., Port Fairy, Victoria	42	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{1}{2}$	90 $\frac{1}{2}$

Export cheese, coloured, unpasteurised; suitable for the English market; two, each 70 to 80 lb., stored for six weeks.

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
Pittsworth Dairy Co., Ltd., No. 4 Factory ..	46	24 $\frac{3}{4}$	14 $\frac{3}{4}$	9 $\frac{3}{4}$	95 $\frac{1}{4}$
Downs Co-operative Dairy Co., Ltd., Westbrook	45 $\frac{1}{2}$	24 $\frac{3}{4}$	14 $\frac{3}{4}$	9 $\frac{1}{2}$	94 $\frac{1}{2}$
Downs Co-operative Dairy Co., Ltd., Koondai ..	45	24 $\frac{3}{4}$	14 $\frac{3}{4}$	9 $\frac{1}{2}$	91
Malling Co-operative Cheese Society, Ltd., Mac-lagan	41	24 $\frac{1}{2}$	14 $\frac{3}{4}$	9 $\frac{1}{4}$	92 $\frac{1}{2}$
Mount Tyson Farmers' Co-operative Dairy Co., Ltd.	44	24 $\frac{1}{2}$	15	9	92 $\frac{1}{2}$
Biddeston Co-operative Dairy Co., Ltd.	42	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{1}{2}$	90 $\frac{1}{2}$

CHEESE AWARDS—*continued.*

Export Cheese, coloured, unpasteurised; suitable for the English market; two each 70 to 80 lb.; stored for six weeks—*continued.*

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
Cooranga North Co-operative Dairy Co., Ltd. ..	41½	24½	14½	9½	90
Pittsworth Dairy Co., Ltd., No. 3. Factory ..	41½	24½	14½	9½	90
Downs Co-operative Dairy Co., Ltd., Gowrie Junction	40	24	14	9½	87½
Rodgor's Creek Cheese Factory	39	24½	14½	9½	87½
Koorongarra Co-operative Dairy Co., Ltd. ..	38	24½	14½	9½	86½
Pittsworth Dairy Co., Ltd., No. 1 Factory ..	38	24	14½	9½	86½
Downs Co-operative Dairy Co., Ltd., Jondaryan ..	39	24	13½	9½	86
Nathan, Joseph, and Co. (Aust.), Ltd., Port Fairy, Victoria	38	24	14	9½	85½
Gayndah Co-operative Dairy Co., Ltd., Byrnes-town	36	24	14	8½	82½

Medium cheese, over two months old, pasteurised; two, each not exceeding 40 lb.

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
Southbrook Co-operative Dairy Co., Ltd. ..	46	25	14½	9½	94½
Pittsworth Dairy Co., Ltd., No. 2 Factory ..	45½	25	14½	9½	94½
Cooranga North Co-operative Dairy Co., Ltd. ..	45	25	15	9	94
Mount Tyson Farmers' Co-operative Dairy Co., Ltd.	45	24	15	9	93
Pittsworth Dairy Co., Ltd., No. 1 Factory ..	44½	24½	14½	9½	93
Malling Co-operative Cheese Society, Ltd. ..	43½	25	15	9	92½
Nathan, Joseph, and Co. (Aust.), Ltd., Port Fairy, Victoria	42	24½	14½	9½	90¾

Medium cheese, over two months old, unpasteurised; two, each not exceeding 40 lb.

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
Pittsworth Dairy Co., Ltd., No. 1 Factory ..	46½	25	14½	9½	95½
Malling Co-operative Cheese Society, MacLagan ..	46	24¾	14½	9½	95
Pittsworth Dairy Co., Ltd., No. 3 Factory ..	45	25	14¾	9½	94
Mount Tyson Farmers' Co-operative Dairy Co., Ltd.	44	25	14½	9	92¾
Cooranga North Co-operative Dairy Co., Ltd., Binjour	44	24¾	14½	9	92½
Biddeston Co-operative Dairy Co., Ltd. ..	43½	24½	14½	9½	92
Oakey District Co-operative Butter Co., Ltd., Crosshill	42½	25	15	9½	91¾
Oakey District Co-operative Butter Co., Ltd., Kelvinhaugh	42½	24½	14½	9½	91

CHEESE AWARDS—*continued.*

Medium cheese, over two months old, unpasteurised; two, each not exceeding 40 lb.—*continued.*

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
Cooranga North Co-operative Dairy Co., Ltd. ..	41 $\frac{1}{2}$	24 $\frac{3}{4}$	14 $\frac{1}{2}$	9 $\frac{1}{2}$	90
Downs Co-operative Dairy Co., Ltd., Koondai ..	41 $\frac{1}{2}$	24 $\frac{3}{4}$	14 $\frac{1}{2}$	9 $\frac{1}{2}$	90
Pittsworth Dairy Co., Ltd., No. 4 Factory ..	41	24 $\frac{3}{4}$	14 $\frac{3}{4}$	9 $\frac{1}{2}$	90
Kooroongarra Co-operative Dairy Co., Ltd. ..	41	24 $\frac{1}{4}$	14 $\frac{3}{4}$	9	89
Warwick Butter and Dairy Co., Ltd., Greymare ..	41	24 $\frac{1}{4}$	14 $\frac{3}{4}$	9	88 $\frac{3}{4}$
Rodger's Creek Cheese Factory	41 $\frac{1}{2}$	24	14 $\frac{1}{2}$	8 $\frac{1}{2}$	88 $\frac{1}{2}$
Downs Co-operative Dairy Co., Ltd., Jondaryan	40	24 $\frac{1}{2}$	14 $\frac{1}{4}$	9 $\frac{1}{2}$	88 $\frac{1}{4}$
Nathan, Joseph, and Co., (Aust.) Ltd., Port Fairy, Victoria	40	24 $\frac{1}{2}$	14	9 $\frac{1}{2}$	88
Warwick Butter and Dairy Co., Ltd., Talgai ..	40	24 $\frac{1}{4}$	14 $\frac{1}{2}$	9	87 $\frac{3}{4}$
Downs Co-operative Dairy Co., Ltd., Hodgson's Vale	39	24 $\frac{1}{4}$	14 $\frac{1}{2}$	9 $\frac{1}{4}$	87
Warwick Butter and Dairy Co., Ltd., Pratten ..	40	23 $\frac{1}{2}$	13 $\frac{3}{4}$	9 $\frac{1}{2}$	86 $\frac{1}{2}$

Medium cheese, under six weeks old; pasteurised; two, each not exceeding 40 lb.

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
Malling Co-operative Cheese Society, Ltd., Mac- lagan	46	24 $\frac{3}{4}$	14 $\frac{1}{2}$	10	95 $\frac{1}{4}$
Mount Tyson Farmers' Co-operative Dairy Co., Ltd.	45 $\frac{1}{2}$	25	14 $\frac{3}{4}$	9 $\frac{3}{4}$	95
Pittsworth Dairy Co., Ltd., No. 2 Factory ..	46	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{1}{4}$	94 $\frac{3}{4}$
Pittsworth Dairy Co., Ltd., No. 1 Factory ..	45	24 $\frac{1}{2}$	14 $\frac{1}{2}$	10	94
Southbrook Co-operative Dairy Co., Ltd. ..	45	25	14	9 $\frac{1}{4}$	93 $\frac{1}{4}$
Biddeston Co-operative Co., Ltd.	44	24 $\frac{1}{2}$	14 $\frac{1}{2}$	10	93
Nathan, Joseph, and Co. (Aust.), Ltd., Port Fairy, Victoria	42 $\frac{1}{2}$	24 $\frac{1}{2}$	14 $\frac{1}{2}$	10	91 $\frac{1}{2}$
Cooranga North Co-operative Dairy Co., Ltd. ..	42 $\frac{1}{2}$	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9	90 $\frac{1}{2}$

Medium cheese, under six weeks old, unpasteurised; two, each not exceeding 40 lb.

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
Pittsworth Dairy Co., Ltd., No. 3 Factory ..	46	24 $\frac{3}{4}$	14 $\frac{3}{4}$	8 $\frac{3}{4}$	94 $\frac{1}{4}$
Downs Co-operative Dairy Co., Ltd., Westbrook	45	24 $\frac{3}{4}$	14 $\frac{3}{4}$	9 $\frac{1}{2}$	94
Malling Co-operative Cheese Society, Ltd., Mac- lagan	44	24 $\frac{3}{4}$	14 $\frac{3}{4}$	9 $\frac{1}{2}$	93
Pittsworth Dairy Co., Ltd., No. 1 Factory ..	43	24 $\frac{3}{4}$	14 $\frac{3}{4}$	9 $\frac{1}{2}$	92
Downs Co-operative Dairy Co., Ltd., Koondai ..	43	24 $\frac{1}{2}$	14 $\frac{3}{4}$	8 $\frac{3}{4}$	91
Yargullen Co-operative Dairy Co., Ltd. ..	43	24 $\frac{1}{2}$	14 $\frac{3}{4}$	9 $\frac{1}{2}$	91
Biddeston Co-operative Dairy Co., Ltd. ..	41 $\frac{1}{2}$	25	14 $\frac{3}{4}$	9 $\frac{3}{4}$	90 $\frac{3}{4}$
Pittsworth Dairy Co., Ltd., No. 4 Factory ..	42	24 $\frac{3}{4}$	14 $\frac{3}{4}$	9 $\frac{1}{4}$	90 $\frac{3}{4}$
Warwick Butter and Dairy Co., Ltd., Pratten ..	42	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{1}{4}$	90 $\frac{1}{4}$

CHEESE AWARDS—*continued.*

Medium cheese, under six weeks old, unpasteurised; two, each not exceeding 40 lb.—*continued.*

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
Downs Co-operative Dairy Co., Ltd., Hodgson's Vale	41	24 $\frac{3}{4}$	14 $\frac{1}{2}$	9 $\frac{1}{2}$	90
Mount Tyson Farmers' Co-operative Dairy Co., Ltd.	41	24 $\frac{3}{4}$	14 $\frac{3}{4}$	9 $\frac{1}{2}$	90
Pittsworth Dairy Co., Ltd., No. 5 Factory	41	24 $\frac{3}{4}$	14 $\frac{3}{4}$	8 $\frac{3}{4}$	90
Warwick Butter and Dairy Co., Ltd., Greymare	41 $\frac{1}{2}$	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{1}{2}$	89 $\frac{1}{2}$
Mount Sibley Co-operative Dairy Co., Ltd., Greenmount	41 $\frac{1}{2}$	24 $\frac{1}{2}$	14 $\frac{3}{4}$	9	89 $\frac{1}{2}$
Warwick Butter and Dairy Co., Ltd., Tulgai	41	24	14 $\frac{1}{2}$	9 $\frac{1}{4}$	89 $\frac{1}{4}$
Cooranga North Co-operative Dairy Co., Ltd.	41	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{1}{2}$	89
Oakey District Co-operative Butter Co., Ltd., Kelvinhaugh	40	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{1}{2}$	88 $\frac{1}{2}$
Nathan, Joseph, and Co. (Aust.), Ltd., Port Fairy, Victoria	40	24 $\frac{1}{2}$	14	9 $\frac{1}{2}$	88
Downs Co-operative Dairy Co., Ltd., Jondaryan	38	24 $\frac{1}{2}$	14	9 $\frac{1}{2}$	86 $\frac{1}{2}$
Rodger's Creek Cheese Factory	38	24	14	8 $\frac{3}{4}$	84 $\frac{3}{4}$

Loaf cheese, over two months old, pasteurised; two, not exceeding 12 lb.

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
Biddeston Co-operative Dairy Co., Ltd.	46	25	14 $\frac{3}{4}$	10	95 $\frac{3}{4}$
Pittsworth Dairy Co., Ltd., No. 2 Factory	46	24 $\frac{3}{4}$	14 $\frac{3}{4}$	10	95 $\frac{1}{2}$
Mount Tyson Farmers' Co-operative Dairy Co., Ltd.	45	25	14 $\frac{3}{4}$	10	94 $\frac{3}{4}$
Pittsworth Dairy Co., Ltd., No. 1 Factory	45	25 $\frac{3}{4}$	14 $\frac{3}{4}$	10	94 $\frac{1}{2}$
Southbrook Co-operative Dairy Co., Ltd.	44 $\frac{1}{2}$	25	14 $\frac{3}{4}$	10	94 $\frac{1}{2}$
Malling Co-operative Cheese Society, Ltd., Macalagan	44 $\frac{1}{2}$	25	15	9 $\frac{1}{2}$	94
Nathan, Joseph, and Co. (Aust.), Ltd., Port Fairy, Victoria	43	24 $\frac{3}{4}$	14 $\frac{1}{2}$	10	92 $\frac{1}{2}$

Loaf cheese, over two months old, unpasteurised; two, not exceeding 12 lb.

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
Pittsworth Dairy Co., Ltd., No. 1 Factory	45	25	14 $\frac{3}{4}$	9 $\frac{1}{2}$	94 $\frac{1}{2}$
Pittsworth Dairy Co., Ltd., No. 4 Factory	45	24 $\frac{3}{4}$	14 $\frac{1}{2}$	9 $\frac{1}{2}$	93 $\frac{3}{4}$
Pittsworth Dairy Co., Ltd., No. 3 Factory	44	25	14 $\frac{3}{4}$	9 $\frac{3}{4}$	93 $\frac{1}{2}$
Malling Co-operative Cheese Society, Ltd., Macalagan	44	24 $\frac{3}{4}$	14 $\frac{3}{4}$	9 $\frac{1}{2}$	93
Mount Tyson Farmers' Co-operative Dairy Co., Ltd.	44	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{3}{4}$	92 $\frac{3}{4}$
Downs Co-operative Dairy Co., Ltd., Hodgson's Vale	43 $\frac{1}{2}$	24 $\frac{3}{4}$	14 $\frac{1}{2}$	9 $\frac{1}{2}$	92 $\frac{1}{2}$
Downs Co-operative Dairy Co., Ltd., Jondaryan	43	24 $\frac{3}{4}$	14 $\frac{1}{2}$	10	92 $\frac{1}{4}$
Downs Co-operative Dairy Co., Ltd., Westbrook	43	24 $\frac{1}{2}$	14 $\frac{1}{2}$	10	92

CHEESE AWARDS—*continued.*Loaf cheese, over two months old, unpasteurised; two, not exceeding 12 lb.—*contd.*

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
Oakey District Co-operative Butter Co., Ltd., Kelvinhaugh	43	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{3}{4}$	91 $\frac{3}{4}$
Biddeston Co-operative Dairy Co., Ltd.	42 $\frac{1}{2}$	24	14 $\frac{1}{2}$	9 $\frac{3}{4}$	90 $\frac{3}{4}$
Downs Co-operative Dairy Co., Ltd., Koondai ..	42	24	14 $\frac{1}{2}$	9	90 $\frac{1}{4}$
Warwick Butter and Dairy Co., Ltd., Pratten ..	41 $\frac{1}{2}$	24	14 $\frac{1}{2}$	9 $\frac{1}{2}$	90 $\frac{1}{4}$
Oakey District Co-operative Butter Co., Ltd., Crosshill	41	24 $\frac{1}{2}$	15	9 $\frac{1}{2}$	90
Warwick Butter and Dairy Co., Ltd., Greymane	41 $\frac{1}{2}$	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{1}{2}$	90
Cooranga North Co-operative Dairy Co., Ltd. ..	41	24	14 $\frac{1}{2}$	9 $\frac{1}{2}$	89 $\frac{1}{4}$
Koorongarra Co-operative Dairy Co., Ltd. ..	41	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{1}{2}$	89 $\frac{1}{4}$
Yargullen Co-operative Dairy Co., Ltd.	40	24	14 $\frac{1}{2}$	9 $\frac{1}{2}$	88 $\frac{3}{4}$
Maryborough Co-operative Dairy Co., Ltd., Brooklands	40	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{1}{2}$	88 $\frac{1}{2}$
Nathan, Joseph, and Co. (Aust.), Ltd., Port Fairy, Victoria	40	24 $\frac{1}{2}$	14	9 $\frac{1}{2}$	88
Warwick Butter and Dairy Co., Ltd., Talgai ..	38	24	14 $\frac{1}{2}$	9 $\frac{1}{4}$	85 $\frac{3}{4}$

Loaf cheese, under six weeks old, pasteurised; two, not exceeding 12 lb.

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
Pittsworth Dairy Co., Ltd., No. 2 Factory ..	46	24 $\frac{3}{4}$	14 $\frac{3}{4}$	10	95 $\frac{1}{2}$
Mount Tyson Farmers' Co-operative Dairy Co., Ltd.	45 $\frac{1}{2}$	25	14 $\frac{3}{4}$	9 $\frac{3}{4}$	95
Malling Co-operative Cheese Society, MacLagan	45 $\frac{1}{2}$	24 $\frac{3}{4}$	14 $\frac{3}{4}$	10	94 $\frac{3}{4}$
Pittsworth Dairy Co., Ltd., No. 1 Factory ..	45 $\frac{1}{2}$	24 $\frac{1}{4}$	14 $\frac{1}{2}$	10	94 $\frac{1}{4}$
Southbrook Co-operative Dairy Co., Ltd. ..	44	25	15	10	94
Biddeston Co-operative Dairy Co., Ltd.	45	24 $\frac{3}{4}$	14 $\frac{1}{2}$	9 $\frac{1}{2}$	93 $\frac{1}{2}$
Cooranga North Co-operative Dairy Co., Ltd. ..	44	24 $\frac{3}{4}$	14 $\frac{1}{2}$	9 $\frac{1}{2}$	92 $\frac{3}{4}$
Nathan, Joseph, and Co. (Aust.), Ltd., Port Fairy, Victoria	43	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{3}{4}$	91 $\frac{3}{4}$

Loaf cheese, under six weeks old, unpasteurised; two, not exceeding 12 lb.

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
Biddeston Co-operative Dairy Co., Ltd.	45 $\frac{1}{2}$	24 $\frac{3}{4}$	15	9 $\frac{1}{2}$	94 $\frac{3}{4}$
Malling Co-operative Cheese Society, Ltd., Mac- lagan	44 $\frac{1}{2}$	25	15	10	94 $\frac{1}{2}$
Downs Co-operative Dairy Co., Ltd., Westbrook	45	24 $\frac{1}{4}$	14 $\frac{3}{4}$	10	94
Downs Co-operative Dairy Co., Ltd., Hodgson's Vale	44	25	15	9 $\frac{3}{4}$	93 $\frac{3}{4}$
Downs Co-operative Dairy Co., Ltd., Koondai ..	43 $\frac{1}{2}$	24 $\frac{3}{4}$	15	10	93 $\frac{1}{4}$
Mount Tyson Farmers' Co-operative Dairy Co., Ltd.	43 $\frac{1}{2}$	25	14 $\frac{3}{4}$	10	93 $\frac{1}{4}$

CHEESE AWARDS—*continued*,Loaf cheese, under six weeks old, unpasteurised; two, not exceeding 12 lb.—*contd.*

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
Pittsworth Dairy Co., Ltd., No. 3 Factory ..	44	24 $\frac{3}{4}$	14 $\frac{3}{4}$	9 $\frac{3}{4}$	93 $\frac{1}{4}$
Yargullen Co-operative Dairy Co., Ltd. ..	43 $\frac{1}{2}$	24 $\frac{3}{4}$	14 $\frac{3}{4}$	10	93
Pittsworth Dairy Co., Ltd., No. 4 Factory ..	43	24 $\frac{3}{4}$	14 $\frac{3}{4}$	10	92 $\frac{1}{2}$
Warwick Butter and Dairy Co., Ltd., Talgai ..	43	24 $\frac{3}{4}$	14 $\frac{3}{4}$	10	92 $\frac{1}{2}$
Oakey District Co-operative Butter Co., Ltd., Kelvinhaugh	43	24 $\frac{1}{2}$	17 $\frac{1}{4}$	9 $\frac{1}{2}$	91 $\frac{1}{2}$
Warwick Butter and Dairy Co., Ltd., Greymare ..	43	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{1}{2}$	91 $\frac{1}{2}$
Oakey District Co-operative Butter Co., Ltd., Crosshill	42	24 $\frac{1}{2}$	14 $\frac{1}{2}$	10	91 $\frac{1}{4}$
Mount Sibley Co-operative Dairy Co., Ltd., Green- mount	42	25	14 $\frac{3}{4}$	9 $\frac{1}{4}$	91
Warwick Butter and Dairy Co., Ltd., Pratten ..	42	24 $\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{1}{2}$	90 $\frac{1}{2}$
Nathan, Joseph, and Co. (Aust.), Ltd., Port Fairy, Victoria	42	24	14	9 $\frac{3}{4}$	89 $\frac{3}{4}$
Downs Co-operative Dairy Co., Ltd., Jondaryan ..	39	25	14 $\frac{3}{4}$	10	88 $\frac{3}{4}$

SPECIAL PRIZE FOR THE FACTORY SECURING THE GREATEST AGGREGATE OF POINTS
IN ALL CLASSES (EXCEPT TROPHY) FOR CHEESE.

	Malling Co-operative Cheese Society, Limited, (Maldagen).	Mount Tyson Farmers' Co-operative Dairy Company, Limited.	Pittsworth Dairy Company, Limited, (No. 1 Factory).	Biddeston Co-operative Dairy Com- pany, Limited.	Cooranza North Co-operative Com- pany, Limited.	Southbrook Co-operative Dairy Com- pany, Limited.
Export Cheese, White, 70 to 80 lb. Pas- teurised, 6 weeks	92 $\frac{1}{2}$	95 $\frac{1}{2}$	96 $\frac{1}{2}$	93	..	92
Export Cheese, White, 70 to 80 lb., Unpas- teurised, 6 weeks	93 $\frac{1}{4}$	91	96	90 $\frac{1}{2}$	..	..
Export Cheese, Coloured, 70 to 80 lb., Pas- teurised, 6 weeks	94 $\frac{3}{4}$	94 $\frac{1}{2}$	95 $\frac{3}{4}$	93 $\frac{3}{4}$	95 $\frac{1}{4}$	91
Export Cheese, Coloured, 70 to 80 lb., Unpasteurised, 6 weeks	92 $\frac{1}{2}$	92 $\frac{1}{2}$	86 $\frac{1}{4}$	90 $\frac{1}{2}$	90	..
Medium Cheese, over 2 Months, 40 lb., Pasteurised	92 $\frac{1}{2}$	93	93	..	94	95 $\frac{3}{4}$
Medium Cheese, over 2 Months, 40 lb., Unpasteurised	95	92 $\frac{3}{4}$	95 $\frac{1}{2}$	92	90	..
Medium Cheese, under 6 Weeks, 40 lb., Pasteurised	95 $\frac{1}{4}$	95	94	93	90 $\frac{1}{2}$	93 $\frac{1}{4}$
Medium Cheese, under 6 Weeks, 40 lb., Unpasteurised	93	90	92	90 $\frac{3}{4}$	89	..
Loaf Cheese, over 2 Months, 12 lb., Pas- teurised	94	94 $\frac{3}{4}$	94 $\frac{1}{2}$	95 $\frac{3}{4}$	..	94 $\frac{1}{4}$
Loaf Cheese, over 2 Months, 12 lb., Unpasteurised	93	92 $\frac{3}{4}$	94 $\frac{1}{4}$	90 $\frac{3}{4}$	89 $\frac{1}{4}$	..
Loaf Cheese, under 6 Weeks, 12 lb., Pasteurised	94 $\frac{3}{4}$	95	94 $\frac{1}{4}$	93 $\frac{1}{2}$	92 $\frac{3}{4}$	94
Loaf Cheese, under 6 Weeks, 12 lb., Unpasteurised	94 $\frac{1}{2}$	93 $\frac{1}{4}$	..	94 $\frac{3}{4}$	..	..
Totals	1,125	1,120	1,032	1,018	730 $\frac{3}{4}$	560 $\frac{1}{4}$

CHEESE AWARDS—*continued.*

TROPHY OF CHEESE.

	Quality.	Display.	Effect.	Total.
Possible points	300	100	100	500
Pittsworth Dairy Co., Ltd., Pittsworth	279	98	92	469
Downs Co-operative Dairy Co., Ltd., Toowoomba ..	267	90	98	455

HAMS, BACON, AND BY-PRODUCTS.

BACON, FACTORY CURED, SIX SIDES.

	Flavour.	Texture and Firmness.	Proportion of Fat and Lean.	Trimming and Finish.	Smoking.	Colour.	Total.
Possible points	45	10	10	10	10	15	100
Queensland Co-operative Bacon Co., Ltd., Murarrie	44	9	9	8½	9½	9	89
Queensland Co-operative Bacon Co., Ltd., Murarrie	43	8½	9	8½	9½	9	87½
J. C. Hutton Propy., Ltd., Canterbury, New South Wales ..	42	7½	9	8½	9	8½	84½
J. C. Hutton Propy., Ltd., Brisbane	41	7½	9	7½	9	8	82
J. C. Hutton Propy., Ltd., Brisbane	41½	8	9	7	8½	7½	81½
Foley Bros., Ltd., Northern-Central Creamery, Lismore, New South Wales	40	7	9½	7	8	6½	78
Foggitt, Jones, Ltd., Brisbane ..	41½	5½	9	7	8	6½	77½
Foggitt, Jones, Ltd., Brisbane ..	41½	5½	9	7	8	6½	77½
Foggitt, Jones, Ltd., Brisbane ..	40	5	9	6½	8	6	74½

HAMS, SIX, FACTORY CURED.

J. C. Hutton Propy., Ltd., Brisbane	43	9	9½	9	9	14	93½
Queensland Co-operative Bacon Co., Ltd., Murarrie	44	7½	9	8	8½	13	90
Foley Bros.' Ltd., Northern-Central Creamery, Lismore, New South Wales	43½	8	9	8	8	13	89½
J. C. Hutton Propy., Ltd., Canterbury, New South Wales ..	41½	8½	8½	8	8½	13	88
J. C. Hutton Propy., Ltd., Brisbane	42	7	9	7½	8½	13	87
Foggitt, Jones, Ltd., Brisbane ..	41½	8	7	7	7½	13	84
Foggitt, Jones, Ltd., Brisbane ..	41	7	8	7	7½	13	83½
Foggitt, Jones, Ltd., Brisbane ..	41½	7	7	8	7½	12½	83½
Queensland Co-operative Bacon Co., Ltd., Murarrie	42	6½	7	7	9	12	83½

Sausages, smoked, 14 lb.—Queensland Co-operative Bacon Co., Ltd., Murarrie, 1 and 2. J. C. Hutton Propy., Ltd. (Brisbane), recommended for third prize.

Lard, one box, 56 lb.—Queensland Co-operative Bacon Co., Ltd., Murarrie, 94½ points, 1; Queensland Co-operative Bacon Co., Ltd., Murarrie, 94 points, 2. Foley Bros. Ltd. (Northern Central Creamery), Lismore, New South Wales, 92½ points, 3.

Hams, farmers'.—W. Darling, 64 points, 1.

Hen eggs, judged by weight.—Mrs. W. Vogel 1, Mrs. A. Wyllie 2.

HOME MILKING COMPETITION.

Cow or heifer giving greatest yield of butter fat in 24 hours under Babcock test, milk to contain on an average not less than 3·3 per cent. of butter fat.

		Milk, Lb.	Test.	Butter Fats, Lb.
<i>Illawarra Milking Shorthorns.</i>				
B. O'Connor's Elsie IV. of Oakdale	M.	26·7	3·0	0·942
	N.	25·3	7·5	2·23
	E.	21·5	4·4	1·11
		73·5	..	4·282
J. Phillips' Chance of Woodleigh	M.	23	4·4	1·012
	N.	23	4·4	1·012
	E.	22	5·0	1·10
		68	..	3·124
B. O'Connor's Dahlia II. of Hillview	M.	27½	3·5	0·9625
	N.	25½	3·6	0·918
	E.	27	3·9	1·053
		80	..	2·9335
<i>Ayrshires.</i>				
J. Holmes' Belle of Longlands	M.	29	4·8	1·392
	E.	29	5·5	1·595
		58	..	2·987
J. C. Mann's Violet of Glenmore	M.	26	3·6	0·936
	E.	28	4·0	1·12
		54	..	2·056
G. Bell's Young Duchess IV.	E.	18½	3·2	0·584
	M.	17¾	3·4	0·603
	N.	17	3·3	0·561
		53	..	1·748
<i>Jerseys.</i>				
Duffield and Sons' Talgai Creole	M.	15¾	3·5	0·551
	N.	18¾	7·9	1·481
	E.	18½	7·4	1·369
		53	..	3·401
Duffield and Son's Goldie of Brook Lodge	M.	17	4·0	0·68
	N.	13¾	5·0	0·6875
	E.	16½	5·3	0·8745
		47½	..	2·2420

HOME MILKING COMPETITION—*continued.*

		Milk, Lb.	Test.	Butter Fat, Lb.
<i>Jerseys—continued.</i>				
J. Williams' Carlyle Lady Lynn	M.	15½	4.2	0.651
	N.	12	5.5	0.66
	E.	13	5.3	0.689
		40½	..	2.000
J. Todd's Iekle Girl of Southport	M.	17	3.5	0.595
	N.	14	4.8	0.672
	E.	12½	4.0	0.50
		43½	..	1.767
<i>Freisians.</i>				
P. P. Falt's Dairymaid	M.	26	4.0	1.04
	N.	24	7.0	1.68
	E.	23	3.6	0.828
		73	..	3.548
E. J. Wecker's Oaklea Millbong de Kol	M.	26	4.5	1.170
	N.	26	3.7	0.962
	E.	27½	3.6	0.990
		79½	..	3.122
G. Newman's Belle of Friesland II.	M.	31	3.3	1.023
	N.	29½	3.5	1.032
	E.	23	4.2	0.966
		83½	..	3.0215
P. P. Falt's Dairymaid II. of Ryfield	M.	26	4.8	1.248
	N.	19	4.7	0.898
	E.	22	4.0	0.88
		67	..	8.02
<i>Guernseys.</i>				
A. S. Cooke's Golden Girl II. of Woolongbar	M.	12½	4.8	0.600
	N.	10½	5.7	0.598
	E.	10	5.6	0.560
		33	..	1.758
Jackson and Schofield's Trixie II.	M.	14½	4.4	0.638
	E.	9½	5.3	0.5035
		24	..	1.1415

MILKING AWARDS.

COW, FOUR YEARS AND OVER, AVERAGING GREATEST DAILY YIELD OF BUTTER-FAT FOR FORTY-EIGHT HOURS.

		Weight of Milk, lb.	Per- centage.	Butter Fat.	Number Points for Butter, 24 hours.	Lactation Points.	Total Points.
B. O'Connor's Elsie 4th of Oakdale	M.	25-14	3-7	·9573	..	..	..
	E.	25-12	3-8	·9785	..	..	..
	M.	22-1	3-5	·7721	..	..	..
	E.	27-3	3-3	·8971	..	..	..
	M.	26-3	4-7	1-2308	..	..	..
	E.	23-4	4-2	·9765	..	..	..
		150-5	..	5-8123	46-50	5-2	51-70
J. Phillip's Chance of Woodleigh	M.	22-4	4-2	·9345	..	..	..
	E.	19-8	4-3	·8385	..	..	..
	M.	20-14	4-3	·8976	..	..	..
	E.	23-10	3-5	·8268	..	..	..
	M.	21-11	4-0	·8675	..	..	..
	E.	21-6	3-8	·8722	..	..	..
		129-5	..	5-1771	41-42	..	41-42
Macfarlane Bros.' Violo 26th of Darbarlara	M.	23-6	4-1	·9583	..	..	..
	E.	21-0	3-9	·8190	..	..	..
	M.	19-9	3-7	·7238	..	..	..
	E.	24-6	3-4	·8287	..	..	..
	M.	20-2	4-1	·8251	..	..	..
	E.	19-2	3-5	·6693	..	..	..
		127-9	..	4-8242	38-59	..	38-59
A. Pickel's Model of Blacklands	M.	20-1	3-8	·7623	..	..	..
	E.	19-12	4-0	·7900	..	..	..
	M.	20-1	4-3	·8626	..	..	..
	E.	22-15	3-2	·7430	..	..	..
	M.	21-3	4-0	·8475	..	..	..
	E.	18-4	4-2	·7665	..	..	..
		122-4	..	4-7629	38-10	..	38-10
R. Mears's Hazel of Morden	M.	18-8	3-5	·6475	..	..	..
	E.	15-14	3-9	·6191	..	..	..
	M.	16-6	4-0	·6550	..	..	..
	E.	15-15	2-9	·4621	..	..	..
	M.	16-12	3-7	·6197	..	..	..
	E.	16-11	4-2	·7008	..	..	..
		100-2	..	3-7042	29-63	7-9	37-53
Brown Bros.' Korndyke Lottie Canary	M.	15-5	4-1	·6278	..	..	..
	E.	12-0	4-3	·5160	..	..	..
	M.	12-7	3-9	·4850	..	..	..
	E.	16-8	3-7	·6105	..	..	..
	M.	13-9	3-8	·5153	..	..	..
	E.	13-3	3-8	·5011	..	..	..
		83-0	..	3-2557	26-04	10-0	36-04

MILKING AWARDS—*continued.*COW, FOUR YEARS AND OVER, AVERAGING GREATEST DAILY YIELD OF BUTTER-FAT FOR FORTY-EIGHT HOURS—*continued.*

		Weight of Milk, lb.	Per- centage.	Butter Fat.	Number Points for Butter, 24 hours.	Lactation Points.	Total Points.
Cowan Keys's Waitress	M.	24.4	3.3	.8002	..	..	..
	E.	21.0	3.8	.7980	..	..	..
	M.	19.12	3.6	.7110	..	..	..
	E.	23.4	3.6	.8370	..	..	..
	M.	18.10	3.9	.7263	..	..	..
	E.	18.9	3.3	.6125	..	..	..
		125.7	..	4.485	35.88	..	35.88
R. Mears's Tulip of Morden	M.	19.4	3.6	.6930	..	..	..
	E.	14.6	4.6	.6612	..	..	..
	M.	17.10	4.9	.8636	..	..	..
	E.	18.12	4.6	.8625	..	..	..
	M.	14.3	4.6	.6526	..	..	..
	E.	16.8	4.5	.7425	..	..	..
		100.11	..	4.4754	35.80	..	35.80
W. F. Hammel's Violet	M.	20.4	3.4	.6885	..	..	..
	E.	16.9	5.7	.9440	..	..	..
	M.	14.2	4.8	.7680	..	..	..
	E.	15.8	3.1	.4805	..	..	..
	M.	16.11	4.9	.8176	..	..	..
	E.	15.1	4.0	.6025	..	..	..
		98.3	..	4.2111	33.69	1.3	34.89
J. Williams's Carlyle Lady Lynn	M.	16.2	4.5	.7256	..	..	..
	E.	13.15	4.6	.6411	..	..	..
	M.	15.6	5.4	.8302	..	..	..
	E.	16.1	4.2	.6746	..	..	..
	M.	13.2	5.2	.6825	..	..	..
	E.	14.6	4.9	.7043	..	..	..
		89.0	..	4.2583	34.07	.7	34.77
B. O'Connor's Skylark II. of Cosy Camp	M.	17.7	3.5	.6103	..	..	..
	E.	15.4	5.2	.7930	..	..	..
	M.	14.12	4.2	.6195	..	..	..
	E.	18.3	3.2	.5820	..	..	..
	M.	16.10	5.4	.8977	..	..	..
	E.	13.0	4.2	.5460	..	..	..
		95.4	..	4.0485	32.39	..	32.39

MILKING AWARDS—*continued.*COW, FOUR YEARS AND OVER, AVERAGING GREATEST DAILY YIELD OF BUTTER-FAT FOR FORTY-EIGHT HOURS—*continued.*

		Weight of Milk, lb.	Per-centage	Butter Fat.	Number Points for Butter, 24 hours.	Lactation Points.	Total Points.
Brown Bros.' Waimarino	M.	23.14	3.1	.7401	..	..	..
	E.	19.4	3.4	.6545	..	..	..
	M.	17.10	3.4	.5992	..	..	..
	E.	21.8	2.9	.6325	..	..	..
	M.	16.1	3.2	.5320	..	..	..
	E.	21.6	3.6	.7695	..	..	..
		120.4	..	3.9278	31.42	..	31.42
Scott Bros.' Dawn III. of Burradale	M.	18.0	3.5	.6300	..	..	..
	E.	14.2	3.7	.5226	..	..	..
	M.	15.2	3.8	.5747	..	..	..
	E.	18.9	3.4	.6311	..	..	..
	M.	14.2	4.1	.5791	..	..	..
	E.	15.0	3.6	.5400	..	..	..
		94.15	..	3.4775	27.82	..	27.82
R. T. Ward's Duchess III. of Mount View	M.	18.11	3.4	.6353	..	..	..
	E.	15.11	4.1	.6431	..	..	..
	M.	12.7	3.2	.3980	..	..	..
	E.	16.9	3.6	.5962	..	..	..
	M.	14.4	4.1	.5842	..	..	..
	E.	13.4	4.4	.5830	..	..	..
		90.14	..	3.4398	27.52	..	27.52
G. Isle's Colleen II. of Eldo	M.	12.6	3.8	.4702	..	..	..
	E.	11.11	4.8	.5610	..	..	..
	M.	11.8	4.7	.5405	..	..	..
	E.	12.0	3.7	.4440	..	..	..
	M.	11.14	4.8	.5700	..	..	..
	E.	9.13	3.9	.3826	..	..	..
		69.4	..	2.9683	23.74	..	23.74
G. Bell's Young Duchess IV.	M.	15.7	3.8	.5866	..	..	..
	E.	12.14	3.5	.4506	..	..	..
	M.	13.14	3.6	.4995	..	..	..
	E.	16.14	3.1	.5231	..	..	..
	M.	13.7	3.4	.4568	..	..	..
	E.	13.12	3.2	.4400	..	..	..
		86.4	..	2.9566	23.65	..	23.65
G. Isle's Redwing II. of Eldo	M.	10.12	3.8	.4108	..	..	..
	E.	9.2	4.0	.3650	..	..	..
	M.	9.1	3.6	.3262	..	..	..
	E.	11.1	3.9	.4314	..	..	..
	M.	9.1	3.8	.3443	..	..	..
	E.	9.9	3.4	.3251	..	..	..
		58.11	..	2.2028	17.62	..	17.62

MILKING AWARDS—*continued.*

COW OR HEIFER, UNDER FOUR YEARS OLD, AVERAGING THE GREATEST
DAILY YIELD OF BUTTER-FAT FOR FORTY-EIGHT HOURS.

		Weight of Milk, lb.	Per- centage.	Butter Fat.	Number Points for Butter, 24 hours.	Lactation Points.	Total Points.
W. M. Krause's Dolphin of Allawah	M.	20.10	4.5	.9281	..	..	..
	E.	17.7	5.0	.8718	..	..	..
	M.	14.4	3.4	.4845	..	..	..
	E.	18.8	3.4	.6290	..	..	..
	M.	17.10	4.4	.7755	..	..	..
	E.	16.4	5.4	.8775	..	..	..
	
F. O. Hayter's Fussy 3rd of Spurfield	M.	18.14	3.5	.6606	..	..	..
	E.	16.4	3.9	.6337	..	..	..
	M.	16.0	3.8	.6080	..	..	..
	E.	17.15	3.5	.6278	..	..	..
	M.	14.8	4.6	.6670	..	..	..
	E.	14.9	3.8	.5533	..	..	..
		98.2	..	3.7504	30.0	..	30.0
A. Cooke's Golden Girl 2nd of Wollongbar	M.	8.0	5.4	.4320	..	..	..
	E.	7.3	4.5	.3234	..	..	..
	M.	7.12	4.9	.3797	..	..	..
	E.	8.9	4.0	.3425	..	..	..
	M.	9.0	4.5	.4410	..	..	..
	E.	8.2	5.1	.4143	..	..	..
		48.10	..	2.3329	18.66	6.9	25.56
D. Spoor and Sons' Prettyface of Black- lands.	M.	13.1	3.4	.4441	..	..	..
	E.	11.12	3.5	.4112	..	..	..
	M.	10.10	3.3	.3506	..	..	..
	E.	15.1	3.4	.5121	..	..	..
	M.	11.55	3.7	.4416	..	..	..
	E.	12.0	3.5	.4200	..	..	..
		74.7	..	2.5796	20.64	..	20.64

COW OR HEIFER, UNDER FOUR YEARS OLD, AVERAGING THE GREATEST DAILY
YIELD OF BUTTER-FAT FOR FORTY-EIGHT HOURS.

		Weight of Milk, lb.	Per- centage.	Butter Fat.	Number Points for Butter, 24 hours.
W. M. Krause's Dolphin of Allawah	M.	20.10	4.5	.9281	..
	E.	17.7	5.0	.8718	..
	M.	14.4	3.4	.4845	..
	E.	18.8	3.4	.6290	..
	M.	17.10	4.4	.7755	..
	E.	16.4	5.4	.8775	..
		104.11	..	4.5664	2.2832

MILKING AWARDS—*continued.*

COW OR HEIFER, UNDER FOUR YEARS OLD, AVERAGING THE GREATEST DAILY YIELD OF BUTTER-FAT FOR FORTY-EIGHT HOURS—*continued.*

			Weight of Milk, lb.	Per- centage.	Butter Fat.	Number Points for Butter, 24 hours.
F. O. Hayter's Fussy 3rd of Spurfield ..	M.	18-14	3-5	·6606	..	
	E.	16-4	3-9	·6637	..	
	M.	16-0	3-8	·6080	..	
	E.	17-15	3-5	·6278	..	
	M.	14-8	4-6	·6670	..	
	E.	14-9	3-8	·5533	..	
		98-2	..	3-7504	1-8752	
A. Cooke's Shamrock 6th	M.	11-1	5-1	·5641	..	
	E.	10-0	4-9	·4900	..	
	M.	11-1	4-8	·5310	..	
	E.	11-2	4-4	·4895	..	
	M.	11-6	5-2	·5915	..	
	E.	10-0	5-0	·5000	..	
		64-10	..	3-1661	1-5835	
Cowan Keys's Jewel of Sunnymead ..	M.	13-11	4-0	·5475	..	
	E.	11-14	4-1	·4868	..	
	M.	11-6	4-0	·4550	..	
	E.	13-5	3-8	·5058	..	
	M.	10-11	4-1	·4381	..	
	E.	11-0	4-0	·4400	..	
		71-15	..	2-8732	1-4366	
D. Spoor and Sons' Prettyface of Blacklands	M.	13-1	3-4	·4441	..	
	E.	11-12	3-5	·4112	..	
	M.	10-10	3-3	·3506	..	
	E.	15-1	3-4	·5121	..	
	M.	11-15	3-7	·4416	..	
	E.	12-10	3-5	·4200	..	
		74-7	..	2-5796	1-2898	

ROYAL NATIONAL CHAMPION BUTTER-FAT TEST.

Cow, any breeding, averaging the greatest daily yield of butter-fat for forty-eight hours. Points of lactation to be considered. (Special prize presented by Brisbane Newspaper Company, Ltd.)

B. O'CONNOR'S ELSIE IV. OF OAKDALE (I.M.S.).

Total Weight of Milk	..	..	..	..	..	150-5
Butter-Fat	..	..	..	..	..	5-8123
Commercial Butter	..	..	..	..	..	2-9061
Number Points Butter for Twenty-four Hours	..	..	..	..	..	46-50
Lactation Points	..	..	..	..	..	5-2
Total Points	..	..	..	..	..	51-7

MILKING AWARDS—*continued.*

COW YIELDING THE LARGEST SUPPLY OF MILK IN FORTY-EIGHT HOURS.

	Lb.
B. O'Connor's Elsie IV. of Oakdale	150.5
J. Phillips's Chance of Woodleigh	129.5
Macfarlane Bros.' Violo XXVI. of Darbarlara	127.9
Cowan Keys's Waitress	125.7
A. Pickel's Model of Blacklands	122.4
R. Mears's Tulip of Morden	100.11
W. F. Hammel's Violet	98.3
Scott Bros.' Dawn III. of Burradale	94.15
R. T. Ward's Duchess III. of Mount View	90.4
G. Bell's Young Duchess IV.	86.4
G. Isle's Colleen II. of Eldo	69.4
G. Isle's Redwing II. of Eldo	58.11

SPECIAL PRIZE FOR COW GIVING BEST BUTTER-FAT RESULTS.

B. O'Connor's Elsie IV. of Oakdale, 5.8123 lb. of butter-fat.

COW, FOUR YEARS AND OVER, AVERAGING GREATEST DAILY YIELD OF BUTTER FAT FOR FORTY-EIGHT HOURS.

	Total Weight of Milk.	Butter Fat.	Number of Points for Butter, 24 Hours.
B. O'Connor's Elsie IV. of Oakdale	150.5	5.8123	2.9061
J. Phillips's Chance of Woodleigh	129.5	5.1771	2.5885
Macfarlane Bros.' Violo XXVI. of Darbarlara	127.9	4.8242	2.4121
A. Pickel's Model of Blacklands	122.4	4.7629	2.3814
Cowan Keys's Waitress	125.7	4.8850	2.2425
R. Mears's Tulip of Morden	100.11	4.4754	2.2377
J. Williams's Carlyle Lady Lynn	89.0	4.2583	2.1296
W. F. Hammel's Violet	98.3	4.2111	2.1055
B. O'Connor's Skylark II. of Cosy Camp	95.4	4.0485	2.0242
Brown Bros.' Waimarino	120.4	3.9278	1.9639
R. Mears's Hazel of Morden	100.2	3.7042	1.8521
Scott Bros.' Dawn III. of Burradale	94.15	3.4775	1.7387
R. T. Ward's Duchess III. of Mount View	90.14	3.4398	1.7199
G. Isle's Colleen II. of Eldo	69.4	2.9683	1.4841
Geo. Bell's Young Duchess IV.	86.4	2.9566	1.4783
G. Isle's Redwing II. of Eldo	58.11	2.2028	1.1014

THE BUTTER-FAT TEST.

The record quantity of milk was given this year by B. O'Connor's Elsie IV. of Oakdale—150.5 lb. of milk and 5.8123 lb. of commercial butter fat. The amount of commercial butter fat, however, has been twice exceeded—in 1922 by E. D. Lawley's Lorna of Arley, which gave 6.587 lb. from 132 lb. 9 oz. of milk—the record to date; and in 1918 by H. Benbow's Joyce, which gave 5.902 lb. from 122 lb. 12 oz. of milk. The figures for this year, however, will stand comparison with dairying competitions in most parts of the world.

FAT CATTLE.

(Judge, Mr. J. Ross.)

Pen of 3 bullocks, over 4 and under 6 years: Scott Bros., 1; H. Cox and Son, 2. Pen of 3 Hereford bullocks, under 4 years: Ferling Bros., 1; I. J. and M. S. Moore, 2. Pen of 3 bullocks, under 4 years, other than Shorthorns and Herefords: D. W. McLeod, 1; R. A. Howell, 2. Pen of 3 crossbred bullocks, under 4 years: T. Hawkins, 1 and 2. Pen of 3 bullocks, under 4 years, suitable for freezing: I. J. and M. S. Moore. Pen of 3 bullocks, any recognised beef breed suitable for export: I. J. and M. S. Moore. Pen of 3 bullocks, of any recognised polled or dehorned beef breed, suitable for export: D. W. McLeod. Pen of 3 bullocks, suitable for freezing: H. Beak and Sons. Pen of 3 steers, over 2 and under 3 years: I. J. and M. S. Moore, 1; S. Watson and Sons, 2. Pen of 3 Aberdeen Angus steers, over 3 and under 4 years: D. W. McLeod. Pure-bred steer, under 2 years: Archer Bros. Ltd., Minever 4th, 1; J. W. Maxwell, 2. Pen of 3 cows, over 4 and not exceeding 6 years: Macansh Estates Ltd., 1; W. Ross Munro, 2. Bullock, over 4 and not exceeding 6 years: I. J. and M. S. Moore, 1; R. J. Douglas, 2. Bullock, under 4 years: E. C. McConnell, 1; H. Beak and Sons, 2. Steer, under 3 years: I. J. and M. S. Moore, 1 and 2. Heaviest bullock, live weight: C. A. Stenzel. Bullock, for export, not over 4 years: E. C. McConnell, 1; D. W. McLeod, 2. Bullock for local consumption, not over 4 years: E. C. McConnell, 1; I. J. and M. S. Moore, 2. Cow, over 4 and not exceeding 6 years: R. F. Douglas, 1; G. C. Clark, 2.

Herefords.

(Judge, Mr. R. Bach.)

Bull, 4 and under 6 years: J. Sparkes' Manse Banner Prince 1, Archer Bros., Ltd., Fanfare 2nd 2, E. C. McConnell's Cressbrook Merry Boy 3. Bull, 3 and under 4 years: J. H. S. Barnes' King Broadward 1, J. Sparkes' Admiration 2. Bull, 3 and under 3 years: J. H. S. Barnes' Champion Chief 1, C. H. Tindal's Ramornie Royal 2, F. B. Cory's Vermont Prudent Boy 3. Bull, 18 months and under 2 years: J. H. S. Barnes' King Flower 1, E. C. McConnell's Cressbrook Rufus 2, J. Sparkes' Lyndley Plum 3. Bull, 12 and under 18 months: Archer Bros., Ltd., Minever 5th 1, Archer Bros.' Ltd., Fanfare 3rd 2, F. Maxwell's Maxwellton Minerva Resolute 3. Bull calf, 6 and under 12 months: C. H. Tindal's Ramornie Royalist 1, Archer Bros. Ltd., Odin 2, Wilson and McDougall, Ltd's., Balcomba Prince 30th 3. Pair of bulls, 12 months and under 2 years: E. C. McConnell's Cressbrook Rufus and Cressbrook Lord Mayor 1, F. Maxwell's Maxwellton Major and Maxwellton Prime Minister 2. Three bulls, 12 months and under 3 years: F. Maxwell. Cow, 4 and under 6 years: J. H. S. Barnes' Miss Beattie 2nd. Cow, 3 and under 4 years: J. H. S. Barnes' Canning Chance. Cow, with calf at foot: J. H. S. Barnes' Canning Chance. Cow or heifer, 2 and under 3 years: J. Sparkes' Madge Lyndley 1, J. H. S. Barnes' Canning Flower Queen 2. Heifer, 18 months and under 2 years: J. Sparkes' Lyndley Beauty 2nd 1, E. C. McConnell's Cressbrook Saucy 4th 2. Heifer, 12 and under 18 months: J. Sparkes' Ruby Lyndley 2nd. Heifer calf, 6 and under 12 months: J. H. S. Barnes 1, E. C. McConnell's Cressbrook Pattern 7th 2, E. C. McConnell's Cressbrook Rose 9th 3. Pair of heifers, 12 months and under 2 years: J. Sparkes' Lyndley Beauty 2nd and Ruby Lyndley 2nd. Three heifers, 12 months and under 3 years: J. Sparkes. Breeders' group: J. H. S. Barnes 1, J. Sparkes 2, E. C. McConnell 3. Sires' progeny stakes group: J. H. S. Barnes 1, J. Sparkes 2, E. C. McConnell 3. Hereford yearling steer: Archer Bros., Ltd., Minever 4th 1, J. Sparkes' Jumbo Lyndley 2.

Polled Herefords.

Bull, 1 and under 3 years: A. H. Stirrat's King Perfection 1, A. Stirrat's Marvel's Dandy 2. Cow, 3 years and over: A. H. Stirrat's Marvel's Lass 1, A. H. Stirrat's Jewel Admiration 2.

Champions.

Hereford bull: J. H. S. Barnes' Champion Chief. Reserve champion: J. Sparkes' Mansel Banner Prince. Junior Hereford bull: J. H. S. Barnes' King Flower. Hereford cow: J. H. S. Barnes' Miss Beattie 2nd. Reserve champion: J. H. S. Barnes' Canning Chance. Polled Hereford bull: A. H. Stirrat's King Perfection. Reserve champion: A. Stirrat's Marvel's Dandy. Polled Hereford cow: A. H. Stirrat's Marvel's Lass. Reserve champion: A. H. Stirrat's Jewel Admiration.

Devons.

(Judge Mr. Wm. Kent.)

Bull, 3 years and over: R. A. Howell's Forester's "Gold-dust." Bull, 2 and under 3 years: R. A. Howell's First Perfection. Bull calf, 6 and under 12 months: R. A. Howell's Field Marshal 112th 1, R. A. Howell's Field Marshal 113th 2. Cow, 3 years and over: R. A. Howell's Contessa 78th. Heifer calf, 6 and under 12 months: R. A. Howell's Lydia 114th.

Aberdeen Angus.

Bull, 3 years and over: G. C. Clark's Manfred bull. One and under 2 years: G. C. Clark's Fairy Prince. Heifer, 2 and under 3 years: G. C. Clark's Lusty 17th. Heifer, 1 and under 2 years: G. C. Clark's Scottish Peeress. Heifer calf, 6 and under 12 months: G. C. Clark's Miss Manfreda.

Red Polled.

Bull, 3 years and over: E. J. McConnel's Royal Farmer. Bull, 6 months and under 3 years: E. J. McConnel's Marshlands Royal Lark 1, E. J. McConnel's Marshlands Royal Bilton 2.

Herd Bulls.

Three Hereford bulls, one and under 3 years: E. C. McConnel. Three Aberdeen Angus bulls: D. W. McLeod.

Shorthorns.

(Judge, Mr. C. E. Parsons.)

Bull, 4 years and over: J. Burgess's Adcote Butterfly Beau 1, R. P. Lord's Clifton Cherry Colonel 2. Bull, 3 and under 4 years: A. E. Slade's Star of Ulster 1, J. Burgess's Fairy Knight 2. Bull, 2 and under 3 years: A. E. Slade's Warspite III. 1, J. S. Thonemann's Kuyura Duke of Derimut 14th 2. Bull, 18 months and under 2 years: J. S. Thonemann's Kuyura Morning Duke III. 1, late C. E. McDougall Estate's Lyndhurst Royal Peer 37th 2, D. M. Fraser's Langley Pinks Earl 14th 3. Bull, 12 and under 18 months: A. E. Slade's Warspite Adonis 1, J. Burgess's Canning Downs South Donnington 2, J. Burgess's Canning Downs South Fairy Knight 3. Bull calf, 6 and under 12 months: A. E. Slade's Glenbar Mariner 1, A. E. Slade's Glenbar Peer 2, J. Burgess's Canning Downs South Donnington Prince 3. Group of three bulls, 12 months and under 3 years: J. Burgess 1, A. E. Slade 2. Cow, 4 years and over: late C. E. McDougall Estate's Lyndhurst Duchess of Ettrick 1, J. Burgess's Golden Bessie 7th 2, A. E. Slade's Aldsworth Picture 3. Cow, 3 and under 4 years: late C. E. McDougall Estate's Lyndhurst Royal Rose 11th. Cow, with calf at foot: J. Burgess's Golden Bessie 7th 1, J. Burgess's Oxford Floss 2, A. E. Slade's Aldsworth Picture 3. Cow, with two or more of her progeny: J. Burgess's Oxford's Floss 1, J. Burgess's Golden Bessie 7th 2, late C. E. McDougall Estate's Lyndhurst Royal Rose 3. Cow or heifer, 2 and under 3 years: late C. E. McDougall Estate's Lyndhurst Lily of Gurley II. 1, J. Burgess's Oxford Countess 2, J. S. Thonemann's Kuyura Duchess of Derrimut 14th 3. Heifer, 18 months and under 2 years: J. Burgess's Golden Butterfly II. 1, late C. E. McDougall Estate's Lyndhurst Lady Beverley 20th 2. Heifer, 12 and under 18 months: late C. E. McDougall Estate's Lyndhurst Royal Rose 13th 1, J. Burgess's Canning Downs South Lady Donnington 2, J. S. Thonemann's Kuyura Duchess of Derrimut 20th 3. Heifer calf, 6 and under 12 months: J. Burgess's Canning Downs South Oxford Butterfly 1, A. S. Slade's Glenbar Duchess II. 2, Wilson and McDougall Limited Fragrance of Calliope 3. Group of three heifers, 12 months and under 3 years: J. Burgess 1, late C. E. McDougall Estate 2. Sire and progeny: J. Burgess's Adcote Butterfly Beau. Breeder's group: J. Burgess. Exhibitor's group: J. Burgess. Sire's progeny stakes group: J. Burgess 1 and 2, Wilson and McDougall Limited 3.

Champions.

Devon bull: R. A. Howell's Forester's Gold-dust. Devon cow: R. A. Howell's Lusty 17th. Aberdeen Angus bull: G. C. Clark's Manfred. Reserve champion: G. C. Clark's Fairy Prince. Aberdeen Angus cow: G. C. Clark's Scottish Peeress. Red polled bull: E. J. McConnel's Royal Farmer. Reserve champion: E. J. McConnel's Marshlands Royal Lark. Shorthorn bull: A. E. Slade's Star of Ulster. Reserve champion: J. Burgess's Adcote Butterfly Beau. Shorthorn cow: late C. E. McDougall Estate's Lyndhurst Duchess of Ettrick. Reserve champion: J. Burgess's Golden Bessie 7th.

DAIRY BREEDS.**Ayrshires.**

(Judge, Mr. G. L. Wilson.)

Cow, 5 years and over, in milk: J. Holmes's Belle of Longlands 1, J. Holmes's Blanche of Longlands 2, J. C. Mann's Beryl of Crescent Farm 3, J. Holmes's Blonde of Longlands 4. Cow, 4 and under 5 years, in milk: J. Holmes's Blanche 2nd of Longlands 1, J. Holmes's Narelle of Longlands 2. Cow, 3 and under 4 years, in milk: Ferriregal Bros.' Tina of Merivale 1, J. Holmes's Ladybird 2nd of Longlands 2. Heifer, 2 and under 3 years, in milk: J. Holmes's Promise of Longlands 1, Anderson Bros.' Honor Paget of Fairview 2, J. Holmes's Tamar of Longlands 3. Cow, 4 years and over, in calf 6 months: J. Holmes's Thelma of Longlands 1, J. C. Mann's Beryl's Pride of Crescent Farm 2, P. Bell's Agnes of Fairfield 3, J. Holmes's Peggy 2nd of Longlands 4. Heifer, 1 and under 2 years, in milk: J. Holmes's Betty of Longlands. Heifer, 2 and under 3 years, in calf: J. C. Mann's Snow Queen of Crescent Farm 1, J. Holmes's Margaret of Longlands 2, L. H. Paten's Loraine 3rd of Jeyandee 3. Heifer, 1 and under 2 years, dry: J. Holmes's Bella 2nd of Longlands 1, J. C. Mann's Heather Spray of Crescent Farm 2, J. C. Mann's Clarice 2nd of Crescent Farm 3. Heifer calf, 6 and under 12 months: J. Holmes's Tillie of Longlands 1, J. C. Mann's Beryl's Pearl of Crescent Farm 2, P. Bell's Tidy of Bellevue 3. Exhibitors' group: J. Holmes 1, J. C. Mann 2. Sires' Progeny Stakes group: J. Holmes 1 and 2. Bull, 4 years and over: P. Bell's Prince Roy of Longlands 1, R. G. Bell's Jamie of Fairfield 2, J. Holmes's Prince Roy of Fairview 3. Bull, 3 and under 4 years: J. H. Fairfax's Paladin of Marinya 1, F. A. Stimpson's Duncan of Fairview 2, L. H. Paten's Premier of Longlands 3. Bull, 2 and under 3 years: J. T. Knowles' Brian of Longlands 1, F. A. Stimpson's Brother of Fairfield 2, Prisons' Department, St. Helena-Lord 3. Bull, 1 and under 2 years: L. H. Paten's Premier of Jeyandee 1, Anderson Bros.' Jeanette's Masterpiece of Fairview 2, R. G. Bell's Roy of Oaklands 3, J. H. Fairfax's Luminous of Marinya 4. Bull calf, 6 and under 12 months: P. Bell's Nero of Bellevue 1, J. C. Mann's Playboy of Crescent Farm 2, J. Holmes's Gay Lad of Longlands 3. Sire and his progeny, group: P. Bell's Prince Roy of Longlands 1, J. Holmes's Prince Roy of Fairview 2.

Children's Calf Class.

Heifer calf, 6 and under 12 months: W. Ryan's Gay Girl of Dingley Dell. Derby Sweepstakes: Anderson Bros.' Honor Paget of Fairview 1, Smith Bros.' Koolpari Joy 2. Bull calf, 6 and under 12 months: D. Paten's Promise of Jeyandee 1, M. Paten's Moreton of Jeyandee 2.

Guernseys.

(Judge, Mr. W. Carter.)

Cow, 3 years and over, in milk: Jackson and Schofield's Ivy II. 1, A. Cooke's Shamrock VI. 2, Jackson and Schofield's Wingrave 3. Heifer, under 3 years, in milk: Jackson and Schofield's Eva of Bexley 1, A. Cooke's Desdemona of Kelvin 2, A. Cooke's Nimamurra Olga 3. Cow, 3 years and over, in calf 6 months: Jackson and Schofield's Irene 1, Jackson and Schofield's Trixie II. 2, A. Cooke's Fashion of Boorie 3. Heifer, 2 and under 3 years: Jackson and Schofield's Evelyn of Bexley. Heifer, 1 and under 2 years: Jackson and Schofield's Ivy IV. 1, A. Cooke's Shamrock's Lovely 2, Jackson and Schofield's Golden Primrose 3. Heifer calf, 6 and under 12 months: Jackson and Schofield's Ivy V. 1, A. Cooke's Diana's Vanity 2. Bull, 3 years and over: A. E. Gillespie's Moonstone 1, Jackson and Schofield's Montrose Sequel 2, A. Cooke's Victor of Wollongbar 3. Bull, 2 and under 3 years: A. E. Gillespie's Captain of Bexley 1, Jackson and Schofield's Donnington Boy 2. Bull calf, 6 and under 12 months: A. Cooke's Fashion's Luck 1, Jackson and Schofield's Pet Sequel 2. Bull, 1 and under 2 years: Jackson and Schofield's Golden Cherub 1, Jackson and Schofield's Dolly Sequel 2. Exhibitors' group: Jackson and Schofield 1, A. Cooke 2.

Friesians.

(Judge, Mr. J. Pritchard.)

Cow, 4 years and over, in milk: G. Newman's Belle of Friesland II. 1, Brown Bros.' Cornucopia Doral Wayne II. 2, Brown Bros.' S.C.P. Korndyke Lottie Canary 3. Cow, 3 and under 4 years, in milk: Grindles Ltd. Hamburg II. of St. Alban 1, Brown Bros.' Mooroombin Pentiac Girl 2. Heifer, 2 and under 3 years, in milk: E. J. Wecker's Lovely of Glen Carmel 1, Grindels Ltd. Cluny II. of Wolston 2, Brown Bros.' Mooroombin Pandora VI. 3. Cow, 3 years or over, in calf 6 months: P. P. Falt's Dairy Maid 1, Nestle and Anglo-Swiss Condensed Milk Company, Ltd., Duchess III. of Nestles 2, P. P. Falt's Ogame Riverdale Netherland 3, Grindles Ltd.

Lady Creamelle 4. Heifer, 2 and under 3 years, dry: Brown Bros.' Mooroombin Pandora V. 1, Miss W. M. Falt's Queenie of Ryfield 2, C. Behrendorff's Fanny II. of Inavall 3. Heifer, 1 and under 2 years: Brown Bros.' Mooroombin Maud 1, F. I. Connell's Patti of St. Gwithian 2, E. J. Wecker's Brookdale Cadillac Queen 3, Brown Bros.' Mooroombin Bowen 4. Bull, 1 and under 2 years: E. J. Wecker's Netherlands Prince Colantha 1, Grindles Ltd. Magnus of St. Athan 2, F. I. Connell's Ithaca Model Knight 3. Bull calf, 6 and under 12 months: A. O. Sturmer's Ideal of Inavale 1, E. J. Connell's Pabst Model of Larkhall 2, C. Behrendorff's Lady's Pride of Inavale 3. Sire and progeny: E. J. Wecker's Prince Colantha Oaklea 1, Brown Bros.' Pabst Arrowhead 2. Exhibitor's group: G. Newman 1, Brown Bros. 2. Sires Progeny Stakes, group: E. J. Wecker 1, Brown Bros. 2, R. S. Alexander 3.

Children's Calf Class.

Heifer calf, 6 and under 12 months: G. H. Jorgensen's Tiny of Ryfield 1, W. Wecker's Maida Colantha 2nd 2. Bull calf, 6 and under 12 months: W. Wecker's Colantha Johanna Lad.

Jerseys.

(Judge, Mr. B. Anderson.)

Cow, 5 years and over, in milk: E. Burton and Sons' Oxford Golden Buttercup 1, J. G. Henderson's Oxford Girl 2, W. Spresser's Carnation Lucy 3, J. Williams's Carlyle Lady Lynn 4, W. and D. Carr's Carlyle Larkspur 5. Cow, 4 and under 5 years, in milk: H. H. Domin's Oxford Golden Rosette 1, J. Duffield and Sons' Goldie of Brook Lodge 2, W. Spresser's Carnation Golden Dewdrop 3. Cow, 3 and under 4 years, in milk: E. Burton and Sons' Oxford Noble Buttercup 1, J. Collins's Queen of Calton 2, W. W. Mallet's Sultares Pride of Burnleigh 3. Heifer, 2 and under 3 years, in milk: W. Spresser's Carnation Golden Princess 1, J. Sinnamon's Trinity Coral 2, E. Burton and Sons' Oxford Noble Beauty 3, J. Duffield and Sons' Silver Spray of Brook Lodge 4. Heifer, 1 and under 2 years, in milk: W. Spresser's Carnation Butterfly 1, W. Spresser's Carnation Lucy's Queen 2, E. Burton and Sons' Oxford Madeira 3, J. Sinnamon's Trinity Firefly 4. Cow, 4 years and over, and in calf 6 months: W. Spresser's Carnation Silver Spray 1, W. Spresser's Carnation Buttercup 2, J. Duffield and Sons' Talgai Creole 3, E. Burton and Sons' Oxford Buttercup IV. 4, W. and D. Carr's Carlyle Larkspur II. 5. Cow, 3 and under 4 years, and in calf 6 months: E. Burton and Sons' Oxford Noble Belle 1, W. and D. Carr's Carlyle Larkspur III. 2, J. Collins's Trinity Golden Star 3. Heifer, 2 and under 3 years, in calf: W. and D. Carr's Melba 1, W. Spresser's Carnation Little Lucy 2, F. G. Burton's Yimmin Gloria II. 3. Cow, or heifer, Australian bred: E. Burton and Sons 1, J. G. Henderson's Oxford Girl 2, W. Spresser 3, J. Williams's Carlyle Lady Lynn 4. Heifer, 1 and under 2 years, dry: R. J. Hay's Kenmore Songstress 1, E. Burton and Sons' Oxford Clementine 2, A. W. Kibble's White Socks of Woodstock 3, E. McHay's Kenmore Princess 4. Heifer calf, 6 and under 12 months: W. Spresser's Carnation Lucy's Locket 1, J. Sinnamon's Trinity Wallflower 2, W. Spresser's Carnation Lady Bell 3, J. Sinnamon's Trinity Noble Crocus 4, J. Sinnamon's Trinity Sunset 5. Cow and her progeny: E. Burton and Sons' Oxford Golden Buttercup 1, W. Spresser's Carnation Buttercup 2. Sire and his progeny: J. Sinnamon 1, W. Spresser's Carnation Prince 2, E. Burton and Sons' Werribee Clementine's King 3. Exhibitor's group: W. Spresser 1, E. Burton and Sons 2, J. Sinnamon 3. Sires' Progeny Stakes, group: W. Spresser 1 and 2. Bull, 4 years and over: J. Todd's Trinity Alfriston Duke 1, W. Spresser's Carnation Prince 2, W. and D. Carr's Empire of Woodsire 3, J. Sinnamon's Ginger Duke 4. Bull, 3 and under 4 years: J. Sinnamon's Lord Ettrey of Banyule 1, E. Burton and Sons' Werribee Clementine's King 2, R. A. Howell's Apollo 3. Bull, 2 and under 3 years: T. A. Petherick's Trinity Officer 1, J. Collins's Retford K.C. 2, T. Muller's Oxford Palatine's Butter Boy 3, J. Sinnamon's Trinity Ginger Fox 4. Bull, 1 and under 2 years: J. Sinnamon's Trinity Fairy Boy 1, H. E. Neil's Carnation Scots Noble 2, A. W. Kibble's Manager of Woodstock 3, W. W. Mallet's Darby 4. Bull calf, 6 and under 12 months: E. Burton and Sons' Oxford Meatboy 1, J. Sinnamon's Trinity Governor 2, W. and D. Carr's Carlyle Empire 3, E. Burton and Sons' Oxford Brighton King 4.

Children's Calf Class.

Heifer calf, 6 and under 12 months: T. J. Mullen's Norwood Golden Queen 1, E. McKay's Kenmore Duchess 2, W. F. Evans's Angelface of Morago 3, P. Evans's Nona of Morago 4. Bull calf, 6 and under 12 months: A. Mullen's Norwood Golden Boy 1, G. Kibble's Prince of Woodstock 2, W. F. Evans's Mary's Valentine of Morago 3.

Illawarra Milking Shorthorns.

(Judges, Messrs. W. Fredericks and J. Young.)

Cow, 4 and under 5 years, in milk: Macfarlane Bros.' Vido 26th of Darbalara 1, W. Middleton's Buttercup 2nd of Dunmore 2, B. O'Connor's Lady James of Casey Camp 3. Cow, 5 years and over, in milk: A. Pickel's Lavender of Blacklands 1, B. O'Connor's Elsie 4th of Oakvale 2, A. Pickel's Model of Blacklands 3, S. Mitchell's Model of Rosenthal 4. Cow, 3 and under 4 years, in milk: F. O. Hayter's Fussy 3rd of Spurfield 1, W. M. Krause's Dolphin of Allawat 2, W. Middleton's Mountside Plum 3. Heifer, 2 and under 3 years, in milk: Macfarlane Bros.' Bella 5th of Kilbirnie 1, J. A. Robertson's Hope of Blacklands 2, F. O. Hayter's Daphne 2nd of Spurfield 3. Cow, 4 years and over, in calf 6 months, or dry: B. O'Connor's Rosebud 2nd of Greyleigh 1, A. Pickel's Jean 5th of Blacklands 2, B. O'Connor's Dahlia 2nd of Hill View 3, S. Mitchell's Fuchsia of Rosenthal 4. Cow, 3 and under 4 years, in calf 6 months: G. E. J. Chaseling's Daphne of Breendah 1, Scott Bros.' Jean 3rd of Abbotsford 2, R. Mears's Norah 3rd of Morden 3. Heifer calf, 6 and under 12 months: E. J. Wecker's Queenie De Kol 2nd A. Glen Carmal 1, Nestle and Anglo-Swiss Condensed Milk Company's Malvinia of Nestles 2, A. Aitchison's Countess of Cadzou 3. Bull, 4 years and over: G. Newman's Pied Rock 1, Grindles Ltd. Black Prince 2, E. J. Wecker's Prince Colantha Oaklea 3. Bull, 3 and under 4 years: Brown Bros.' Mooroombin Susie Lyons Echo 1, R. S. Alexander's Sir Cluny Colantha 2. Bull, 2 and under 3 years: G. P. Falt's King Hector of Glen Carmal 1, D. C. Pryce's Dutch George of Ithaca 2, A. Aitchison's Pontiac of St. Gwithian 3. Heifer, 2 and under 3 years, dry: Scott Bros.' Golden of Waverley 1, R. Mears's Freda II. of Morden 2, A. Pickel's Daphne III. of Hillview 3. Heifer, 1 and under 3 years: B. O'Connor's Lady Jean of Oakvale 1, C. Keys's Jewel of Sunnymead 2, R. Mears's Plumcot III. of Cozey Camp 3. Heifer calf, 6 and under 12 months: F. O. Hayter's Stately VI. of Spurfield 1, B. O'Connor's Maud of Oakvale 2, B. O'Connor's Calm X. of Oakvale 3. Bull, 4 years and over: G. E. J. Chaseling's Thor of Greyleigh 1, Nestle and Anglo-Swiss Condensed Milk Company's Royal George 2nd of Nestles 2, F. O. Hayter's Sovereign of Warden 3. Bull, 3 and under 4 years: J. W. Scott's Warrior 1st of Hazeldean 1, S. A. Hooper's Lee-Metford of Waterview 2, Macfarlane Bros.' Mowbray 2nd of Kilburnie 3. Bull, 2 and under 3 years: B. O'Connor's Brilliant of Oakvale 1, D. Cahill's Plucky of Spurfield 2, J. Verrall's Peter of Frenchview 3. Bull, 1 and under 2 years: B. O'Connor's Sterling of Oakvale 1, P. Moore's Briton of Sunnyside 2, A. Slade's Larry of Dualwon 3. Bull calf, 6 and under 12 months: W. Middleton's Gay Prince of Bri Bri 1, R. Mears's Nelson of Moreden 2, D. McDougall's Starlight of Sherwood and C. S. Elliott's 6th Knight of the Cedars 3. Sire and his progeny group: G. E. J. Chaseling's Thor of Greyleigh 1, F. O. Hayter's Sovereign of Warden 2, B. O'Connor's Charms Duhalow of Oakvale 3. Exhibitor's group: B. O'Connor 1, A. Pickels 2, G. E. J. Chaseling 3. Sire's Progeny Stakes group: A. Pickels 1, B. O'Connor 2.

Champions.

Illawarra Milking Shorthorn bull: G. E. J. Chaseling's Thor of Greyleigh. Reserve Champion: Nestle and Anglo-Swiss Condensed Milk Company's Royal George 2nd of Nestles.

Children's Calf Class.

Heifer calf, 6 and under 12 months: J. Phillips's Beauty 3rd of Sunnyview 1, H. Pickels's Violet 5th of Blacklands 2, L. Dickfos's Nessie of Normanby 3. Bull calf, 6 and under 12 months: E. J. O'Connor's Lord Clare of Oakvale 1, J. Phillips's Charmer of Sunnyview 2.

Champions.

Guernsey, cow or heifer: Jackson and Schofield's Ivy II. Reserve champion: A. Cooke's Shamrock VI. Bull: A. E. Gillespie's Moonstone. Reserve champion: Jackson and Schofield's Montrose Sequel. Ayrshire cow or heifer: J. Holmes's Belle of Longlands. Reserve champion: J. Holmes's Blanche of Longlands. Bull: J. H. Fairfax's Paladin of Marinya. Reserve champion: P. Bell's Prince Roy of Longlands. Fresian, cow or heifer: P. P. Falt's Dairymaid. Reserve champion: Nestle and Anglo-Swiss Condensed Milk Company's Duchess III. of Nestles. Illawarra Milking Shorthorn, cow or heifer, of Queensland: B. O'Connor's Rosebud II. of Greyleigh. Reserve champion: A. Pickels's Lavender of Blacklands. Champion Fresian bull of Queensland: G. Newman's Pied Rock. Reserve champion: Brown Bros.' Mooroombin Susie Lyons Echo. Champion Jersey bull of Queensland: J. Sinnamon's Lord Eltreay of Banyule. Reserve champion: J. Todd's Trinity Alfristan Duke.

SHEEP.**Fat Sheep.**

(Judge, Mr. W. Trout.)

Pen of 5 merino wethers, over 50 lb.: C. J. Chandler 1, T. J. Webster 2. Under 50 lb.: W. B. Peel 1, H. Roth 2. Pen, suitable for freezing: E. J. McDonough 1, H. Roth 2. Pen, suitable for butcher's trade: E. J. McDonough 1, D. W. McLeod 2. Pen, judge for commercial value, mutton, and wool: W. K. Thomson 1, C. J. Chandler 2. Pen of 5 merino ewes, suitable for butcher's trade: C. J. Chandler 1, W. H. Chandler 2. Pen of lambs: C. J. Chandler 1, E. J. McDonough 2. Pen of crossbred wethers, 70 lb. and over: S. E. Pullen 1, S. H. Grinsell 2. Pen, suitable for butcher's trade: W. L. Stirling 1, D. W. McLeod 2. Pen, suitable for freezing: W. L. Stirling 1, D. W. McLeod 2. Pen, irrespective of weight: D. W. McLeod. Pen, most suitable for freezing for export: C. J. Chandler. Pen, crossbred ewes, suitable for butcher's trade: S. H. Grinsell 1, J. H. Fairfax 2. Pen, crossbred lambs, suitable for export as freezers: W. L. Stirling 1, J. Nicholson 2. Pen, crossbred lambs, judged regardless of weight: S. E. Pullen 1, M. Redman 2. Pen of lambs, suitable for freezing: S. E. Pullen 1, J. H. Fairfax 2. Heaviest crossbred wether: T. Holmes 1 and 2. Heaviest merino wether: C. J. Chandler 1 and 2. Heaviest crossbred ewe: W. K. Thomson 1, S. E. Pullen 2. Heaviest merino ewe: C. J. Chandler 1, J. Nicholson 2.

Stud Sheep—Unhoused.

Strong-woolled merinos: Ram, 3 years and over: R. P. Lord. Ram, 2 and under 3 years: R. P. Lord. Ram, under 2 years: R. P. Lord 1 and 2. Ewe, 3 years and over: R. P. Lord 1 and 2. Ewe, 2 and under 3 years: R. P. Lord. Ewe, under 2 years: R. P. Lord 1 and 2. Medium-woolled merinos: Ram, 3 years and over: R. P. Lord. Ram, 2 and under 3 years: R. P. Lord. Ram, under 2 years: R. P. Lord 1 and 2. Ewe, 3 years and over: R. P. Lord. Ewe, 2 and under 3 years: R. P. Lord. Ewe, under 2 years: R. P. Lord 1 and 2. Fine-woolled merinos: Ram, 3 years and over: R. P. Lord. Ram, 2 and under 3 years: R. P. Lord. Ram, under 2 years: R. P. Lord 1 and 2. Ewe, 3 years and over: R. P. Lord. Ewe, under 2 years: R. P. Lord. Queensland-bred strong-woolled merinos: Ram, 3 years and over: R. P. Lord. Ram, 2 and under 3 years: R. P. Lord 1 and 2. Ram, under 2 years: R. P. Lord 1 and 2. Ewe, 3 years and over: R. P. Lord 1 and 2. Ewe, 2 and under 3 years: R. P. Lord 1 and 2. Ewe, under 2 years: R. P. Lord 1 and 2. Medium-woolled merinos: Ram, 3 years and over: R. P. Lord. Ram, 2 and under 3 years: R. P. Lord 1 and 2. Ram, under 2 years: R. P. Lord 1 and 2. Ewe, 3 years and over: R. P. Lord 1 and 2. Ewe, 2 and under 3 years: R. P. Lord. Ewe, under 2 years: R. P. Lord 1 and 2. Fine-woolled merinos: Ram, 3 years and over: R. P. Lord. Ram, 2 and under 3 years: R. P. Lord. Ram, under 2 years: R. P. Lord 1 and 2. Ewe, 3 years and over: R. P. Lord 1 and 2. Ewe, under 2 years: R. P. Lord 1 and 2.

Champions.

Strong-woolled merinos: Ram, unhoused: R. P. Lord. Reserve champion: R. P. Lord. Ewe: R. P. Lord. Reserve champion: R. P. Lord. Medium-woolled merino ram: R. P. Lord. Reserve champion ewe: R. P. Lord. Ewe: R. P. Lord. Reserve champion: R. P. Lord. Fine-woolled merino ram: R. P. Lord. Reserve champion: R. P. Lord. Ewe: R. P. Lord. Reserve champion ewe: R. P. Lord. Queensland-bred: Strong-woolled merino ram: R. P. Lord. Reserve champion: R. P. Lord. Ewe: R. P. Lord. Reserve champion ewe: R. P. Lord. Medium-woolled merino ram: R. P. Lord. Reserve champion: R. P. Lord. Ewe: R. P. Lord. Reserve champion ewe: R. P. Lord. Fine-woolled merino ram: R. P. Lord. Reserve champion: R. P. Lord. Ewe: R. P. Lord. Reserve champion ewe: R. P. Lord. Queensland-bred ram: R. P. Lord. Queensland-bred ewe: R. P. Lord.

Grand Champions.

Merino ram: R. P. Lord. Reserve grand champion: R. P. Lord.

HORSES.**Stud Horses and Pacers.**

(Judge, Mr. A. D. Playfair.)

Stallion, 6 years and over: A. R. Carr's Ribbonmont 1, W. H. Smith's Sparkling Jewel 2. Stallion, 5 years and over: A. E. Higgins's Ravenswood 1, H. H. Dunkley's Marvin Cole 2. Colt, 2 years: H. A. Strong's Ravensfield. Mare, 5 years and over: S. C. Reeve's Black Ribbon 1, A. J. Schmeig's Golden Queen 2. Filly, 3 years: C. Glindeman's Silver Bells. Filly, 2 years: G. Packer's Eileen Pronto 1, T. R. Wuiske's Dolly Wilkes 2.

Champions.

Trotting stallion: A. R. Carr's Ribbonmont. Reserve champion: W. H. Smith's Sparkling Jewel. Trotting mare: S. C. Reeve's Black Ribbon. Reserve champion: A. J. Schmeig's Golden Queen.

Stud Ponies.

(Judge, Mr. J. J. Fanning.)

Stallions, best adapted for getting harness ponies, any age, driven, not exceeding 14 hands: J. A. Rudd's Hafrod Sensation 1, H. E. Cox's Commandant 2. Not exceeding 14 hands, led: J. A. Rudd's Hafrod Sensation 1, H. E. Cox's Commandant 2. Not exceeding 13 hands: H. Arndt's Black Pastel. Not exceeding 12 hands: J. Young's Ivanhoe II. 1, H. Arndt's Black Pastel 2.

Stallions.

Best adapted for getting saddle ponies, any age, not exceeding 14 hands: E. Pocock's Ludo. Not exceeding 13 hands: E. Pocock's Ludo 1, J. T. Jackson's Dinarth Lad 2. Not exceeding 12 hands: W. Booth's Micky.

Welsh Ponies.

Stallion, any age, not exceeding 14 hands: J. A. Rudd's Hafrod Sensation 1, J. T. Jackson's Dinarth Lad 2.

Pony Mares.

Brood mare, any age, not exceeding 13 hands: Miss A. Mullen's Gold Top 1, A. E. Johnston's Peace 2. Any age, not exceeding 12 hands: W. H. Riching's Lady Model 1, A. T. Noyes's Banglet 2. Brood mare, any age, not exceeding 14 hands: L. Dobon's Llew Lass 1, R. E. Pickels's Dixie 2.

Champions.

Pony stallion, best adapted for getting harness ponies: J. A. Rudd's Hafrod Sensation. Reserve champion: H. E. Cox's Commandant. Pony mare: Miss A. Mullen's Gold Top. Reserve champion: L. Dobon's Llew Lass. Pony stallion, best adapted for getting saddle ponies: E. Pocock's Ludo. Reserve champion: W. Booth's Micky. Welsh pony, stallion: J. A. Rudd's Hafrod Sensation.

Thoroughbreds.

(Judge, Mr. F. White.)

Stallion, 4 years and over, adapted for improving racing stock: M. F. Yore's Polybius 1, J. B. Shannon's Fairy Bob 2, T. Jenning's Amberdown 3. Four years and over, suitable for getting military horses: T. Jenning's Amberdown 1, J. B. Shannon's Fairy Bob 2. Brood mare: M. J. MacGinley's Lady Cyrus.

Remount Mares.

Mare, suited for producing remounts, hacks, hunters: J. P. Hassall's Flip 1, E. J. Stanfield's Edna Wilkes 2, R. E. Pickels's Charm 3.

Champions.

Thoroughbred stallion: M. F. Yore's Polybius. Reserve champion: J. B. Shannon's Fairy Bob. Thoroughbred mare: M. J. MacGinley's Lady Cyrus.

Clydesdales.

(Judge, Mr. J. Sprott.)

Stallion, 5 years and over: A. T. Creswick's Windermere Bay Kennedy 1, J. H. Kilvington's Pride of Glenore 2, G. P. Hohenhan's Square Dale 3. Stallion, 4 years: G. N. Watson's Wigtown Boy 2. Stallion, 3 years: A. T. Creswick's Duncan 1, A. T. Creswick's Macgregor 2. Colt, 2 years: Queensland Agricultural High School and College's Prosfield 1, R. Drew's Craigie Willie 2. Colt, 1 year: G. W. Watson's Sparkling Blaze 2. Mares, 5 years and over: A. T. Creswick's Lady Windermere 1, G. Elliot's Lady Meta 2, J. H. Kilvington's Myrtle 3. Brood mare: G. Elliot's Lady Cellus 1, J. S. Kilvington's Winsome Baroness 2. Filly, 3 years: R. Drew's Lady Maud 1, A. T. Creswick's Florrie 2. Filly, 2 years: A. T. Creswick's Agnes. Filly, 1 year: P. H. Kilvington's Charmer.

Champions.

Draught stallion: A. T. Creswick's Windermere Bay Kennedy. Reserve champion: A. T. Creswick's Duncan. Draught mare: G. Elliot's Lady Cellus. Reserve champion: A. T. Creswick's Lady Windermere.

SWINE.**Berkshires.**

(Judge, Mr. A. F. Grey.)

Boar, 2 years and over: W. J. Warburton's Brentwood Star 1, M. Porter and Sons' Rose Lech Jordy 2. Boar, 1 and under 2 years: Queensland Agricultural High School and College's Murray Glen Star 1, L. S. Ducat's Waterview Don 2. Boar, 6 and under 12 months: A. Macfarlane's Frampton Jack 1, Queensland Agricultural High School and College's Gatton Jo 2. Boar, under 6 months: W. J. Warburton's Playboy 1, W. J. Warburton's Centurion 2. Pen of three boars, under 16 weeks: W. J. Warburton. Boar and progeny: W. J. Warburton's Brentwood Star. Sow, 2 years and over: Queensland Agricultural High School and College's Killarney Stella 1, W. J. Warburton's Northgate Patience 3rd 2. One and under 2 years: L. S. Ducat's Waterview Trixie 1, L. S. Ducat's Waterview Purity 2. Six and under 12 months: L. S. Ducat's Waterview Jewel 1, L. S. Ducat's Brentwood Lorna 2. Under 6 months: Queensland Agricultural High School and College's Gatton Cremorne Flurry 1, L. S. Ducat's Waterview Enid 2. Pen of three sows, under 16 weeks: L. Williams 1, W. J. Warburton 2. Sow, any age, in milk, with litter: W. J. Warburton's Northgate Belle 2nd.

Champions.

Queensland Agricultural High School and College's Murray Glen Star. Reserve champion: W. J. Warburton's Brentwood Star. Sow: Queensland Agricultural High School and College's Killarney Stella. Reserve champion: W. J. Warburton's Northgate Belle 2nd.

Yorkshires.

Boar, 2 years and over: W. J. Warburton's Newington Adventurer. Boar, 1 and under 2 years: W. J. Warburton's Newington Adventurer. Boar, 6 and under 12 months: W. J. Warburton's Douglass 1, W. J. Warburton's Ben 2. Boar, under 6 months: W. J. Warburton's Ted. Pen of 3 boars, under 16 weeks: W. J. Warburton. Boar and his progeny: W. J. Warburton's Newington Adventurer. Sow, 2 years and over: W. J. Warburton's Northgate Ruth. Sow, 1 and under 2 years: W. J. Warburton's Northgate Baroness 1, W. J. Warburton's Northgate Fairy 2. Sow, 6 and under 12 months: W. J. Warburton's Northgate Molly. Sow, under 6 months: W. J. Warburton's Gay Girl. Pen of 3 sows, under 16 weeks: W. J. Warburton. Sow, any age, in milk, with litter: W. J. Warburton.

Tamworths.

Boar, 2 years and over: J. H. Whittaker's Sandy Macqueen. Boar, 1 and under 2 years: A. N. White's Blakeney Romeo 1, Queensland Agricultural High School and College's Danesboro Fred 2. Boar, 6 and under 12 months: S. A. Farley's Broxburn Promise 1, Queensland Agricultural High School and College's Blakeuey Rex 2. Boar, under 6 months: Queensland Agricultural High School and College's Gatton Chatham 1, J. H. Whittaker's Broxburn Chatham 2. Pen of 3 boars, under 16 weeks: A. N. White 1, J. H. Whittaker 2. Boar and his progeny: J. H. Whittaker's Sandy Macqueen 1, A. N. White's Blakeney Romeo 2. Sow, 2 years and over: Queensland Agricultural High School and College's Rosebank Rosy Queen 1, J. H. Whittaker's Manning Ruby 2. Sow, 1 and under 2 years: A. N. White's Blakeney Ribbons 1, Queensland Agricultural High School and College 2. Sow, 6 and under 12 months: A. N. White's Blakeney Rona 1, A. N. White's Blakeney Rene 2. Sow, under 6 months: Queensland Agricultural High School and College's Gatton Lady 1, J. H. Whittaker's Broxburn Lizzie 2. Pen of 3 sows, under 16 weeks: A. N. White 1, J. H. Whittaker 2. Sow any age, in milk, with litter: J. H. Whittaker's Broxburn Lass 1, J. H. Whittaker's Broxburn Mayflower 2.

Poland-Chinas.

Boar, 1 and under 2 years. Yalden Bros.' Baynes Wood Judge 1, A. W. White's Blakeney Rebel 2. Boar, 6 and under 12 months: A. W. White's Blakeney Royal 1, J. H. Whittaker's Broxburn Liberator 2. Boar, under 6 months: Yalden Bros. 1 and 2. Sow, 2 years and over: Queensland Agricultural High School and College's Danesboro Winnie. Sow, 6 and under 12 months: A. W. White's Blakeney Revenue 1, A. W. White's Blakeney Rapture 2. Sow, under 6 months: J. H. Whittaker's Broxburn Playmate 1, A. W. White's Blakeney Renown 2.

Duroc-Jerseys.

Boar, any age: Brown Bros.' Mooroombin Chieftain. Sow any age: Brown Bros.' Mooroombin Jewel 1, Brown Bros.' Mooroombin Belle 2.

FRUIT.

Oranges.

(Judge: Mr. M. Finlayson.)

Valentia: R. A. Ulecoq 1, P. G. Collins 2. Mediterranean, sweet: H. L. Roach. Sabina: H. L. Roach 1, J. T. Tennent 2. Washington navel: H. L. Roach 1, A. R. Ulecoq 2. Dunning's navel: R. A. Ulecoq 2. Seedling: A. R. Ulecoq 1, J. Steggall 2. Mandarins, Emperor of Canton: R. A. Ulecoq 1, H. L. Roach 2. Scarlet: J. Steggall 1, R. Dunlop 2. Glen Retreat: A. R. Ulecoq 1, J. Steggall 2. Any other variety: A. E. Vise 1, H. L. Roach 2. Seville: Mrs. R. P. Gale. Shaddocks: A. E. Vise. Any new variety citrus fruits: H. L. Roach.

Lemons.

Any variety, uncured: M. M. Floyd 1, P. G. Collins 2. Suitable for peel: A. R. Ulecoq. Limes, Tahiti: A. E. Vise 1, J. T. Tennant 2.

Bananas.

Ladies' Fingers: A. E. Vise. Sugar: T. Coulston.

Pineapples.

Ripley Queen: H. Willmott. Rough leaf: P. C. Albury. Smooth leaf: A. E. Robinson 1, J. E. Renouf 2.

Strawberries.

Aurie: J. C. Jackes 1, F. and E. Webber 2. Phenomenal: Lockett Bros. 1, E. W. Weller 2.

Cape Gooseberries.

J. C. Jackes.

Passion Fruit.

H. E. Bishop 1, J. S. Dunlop 2.

Pawpaws.

T Coulston 1, J. A. Carbine 2.

For Export.

Oranges, unwrapped: P. G. Collins 1, J. T. Tennent 2. Wrapped: J. T. Tennent 1, P. G. Collins 2. Lemons, cured and wrapped: R. A. Ulecoq 1 and special. Cavendish bananas: A. Martin 1, H. J. Digweed 2, J. J. Tannei 3. Pines, Ripley Queens: Lockett Bros. 1, H. Willmott 2. Smooth leaf: J. E. Renouf 1, A. E. Robinson 2.

FRUIT AND VEGETABLES.

The fruit and vegetable section was well worth a visit for several reasons, one of which is the wonderful capabilities of the so-called "tropical" areas. There were three district exhibits in vegetables—Linville (at the head of the Brisbane Valley), Rockhampton, and Bowen. The latter's display included similar vegetables to those grown in Linville, with the exception of cauliflowers, but in their place had the giant capsicum. Rockhampton had excellent samples of cauliflowers, cabbage, and English potatoes.

The display of individual exhibitors was not nearly up to the quality of the exhibits staged by the districts, which, perhaps may be taken as an example of the value of co-operative effort. The Central Queensland display took the eye immediately, and one noticed jack fruit, cumquats, and pineapples side by side with beautiful quality English strawberries. Truly it may be said that Queensland is a Queen State.

DISTRICT FRUIT EXHIBITS.

The following is the tabulated statement of points gained by the contestants in the district fruit exhibits:—

	Bananas, 35.	Pineapples, 35.	Citrus, 35.	Custards, 10.	Papaws, 10.	Strawberries, 10.	Other fruits, 10.	Packing and grading, 35.	General display, 20.	Total, 200.
Palmwoods..	20	20	26	5	6	7	6	25	14	129
Redlands ..	9	28	20	10	7	10	9	22	12	127
Central Queensland	7	25	33	3	8	5	7	19	15	122
Cooran ..	25	16	..	..	6	2	6	9	6	70
Bowen ..	..	15	22	..	4	5	8	8	6	68

COTTON.

Plants, upland type:—

SCALE OF POINTS AND POINTS AWARDED.

	Desirability of type, 20.	Fruitfulness, 20.	Uniformity of length of fibre, 15.	Uniformity of strength of fibre, 15.	Stormproof qualities, 10.	Degree of opening of bolls, 10.	Earliness, 10.	Total, 100.
A. B. Cadell.. ..	10	20	13	12	5	8	10	78
P. J. J. Kakebeeko.. ..	15	7	12	12	7	4	5	62

Matured open bolls of seed cotton, upland type:—

	Weight of bolls, 20.	Uniformity of length of fibre, 20.	Uniformity of strength of fibre, 20.	Degree of opening of bolls, 20.	Drag of lint, 10.	Character of lint, 10.	Total, 100.
Mrs. W. Preston	17½	18	18	20	9½	10	93
B. Osmond	20	17	18	20	8½	9	92½
A. B. Cadell	20	17	17	20	8½	9	91½
R. Gibson	19½	16	16	20	8	8	87½
J. A. Preaulx	19	16	16	19	8	8	86
V. Bray	19½	15	15	18	8	7	82½
Queensland Acclimatisation Society	14	16	16	17	8	7	78
P. J. J. Kakebeeko	11	12	14	16	9	9½	71½

COTTON—*continued.*

Seed cotton, uplands type :—

				Size of locks, 20.	Uniformity of length of fibre, 20.	Uniformity of strength of fibre, 20.	Drag of lint, 15.	Character of lint, 15.	Cleanliness, 10.	Total, 100.
Mrs. W. Preston	..	..	..	16 $\frac{1}{2}$	19	19	15	14	10	93 $\frac{1}{2}$
B. Osmond	..	..	..	19	17	18	13	13 $\frac{1}{2}$	10	90 $\frac{1}{2}$
L. Tois	..	..	..	20	19	15	12	12	10	88
Archie Chalmers	..	..	..	20	18	18	10	11	10	87
Alex. Chalmers	..	..	..	17	14	16	8	13	10	78
Queensland Acclimatisation Society				16	14	14	13	12	8	77
R. Gibson	..	..	..	16	13	13	13	12	9 $\frac{1}{2}$	76 $\frac{1}{2}$
A. B. Cadell	..	..	..	17	12	12	8	12	10	71
J. A. Preaulx	..	..	..	15	12	12	12	12	7	70
V. Bray	..	..	..	16	10	10	10	10	8	64
P. J. J. Kakebeeke	..	..	..	10	14	12	9	12	4	61

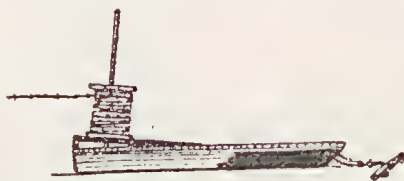
STATE CANNERY EXHIBIT.

The popularity of "State" jams may be judged by the fact that the sales to date exceed 7,000,000. The jams, it is pointed out, are made to a large extent from Queensland fruits, grown by ex-soldiers on the settlements created by the Queensland Government. In addition to the ordinary varieties of jams a speciality is made of marmalade, the product of the State Cannery being claimed to be equal to the best Scotch. The State tomato sauce is reported to be enjoying a considerable vogue right throughout the State. It is prepared from tomatoes grown on the soldiers' settlements in the Stanthorpe district, and has a flavour and piquancy distinctly its own. The sauce is packed in water-white octagonal-shaped bottles, with a screw top. The whole of the crop of pineapples grown on the Beerberrum settlement, the State Enterprises Department points out, is absorbed by the State Cannery. Evidence of the high quality of the preserved product is provided in the fact that the whole of the last summer pack was immediately disposed of to English and Canadian buyers, and large orders at satisfactory prices were forthcoming if further supplies had been available. Unfortunately, the season was a poor one for quantity. The winter pack promises to be ample for market requirements.

The Show exhibit of the Cannery was one of the most notable features of the Pavilion displays.

BARBED WIRE CARRIER.

A contributor to "Country Gentleman" states that by mounting a roll of barbed wire on a sled it can be stretched out more rapidly by one man than by any other way with two. The sled is made narrow, so that it will go through any place a horse can get through. A 1 $\frac{1}{2}$ -inch hole is bored through the floor at the rear end of the sled. A piece of $\frac{3}{4}$ -inch gas pipe about 4 feet long is placed through the spool of wire and one end in the hole of the sled. The wire is fastened to the corner



post and the horse is driven along the line of fence. The operator drives with one hand and with the other hand holds the top of the pipe. By tilting the pipe forward it acts as a brake, and any tension desired can be obtained. By placing a 12 or 14-inch board, 2 feet long, on the rear of the sled and raising one end 2 or 3 inches, you will get about the right tension on the wire while unrolling. Boring a hole through this board and resting the end of the pipe on the floor underneath keeps the pipe from slipping down and catching on obstructions under the sled.

STUD PIGS AT THE BRISBANE SHOW.

EXCELLENT QUALITY STOCK EXHIBITED.

E. J. SHELTON, H.D.A., Instructor in Pig Raising.

The Pig Section at Brisbane Show this year was noted both for increased entries and for improved quality of the various animals exhibited. The Stud Pig Sales were also a record, the number of pigs sold being in excess of previous sales, and the prices generally were on a higher scale.

The stock purchased by the writer last Easter at the Sydney Show maintained their reputation in the show ring by securing four of the coveted championships, only in one case, that of the Tamworth boar, "Danesboro Fred," taking second place; in this case the boar referred to being beaten by that old champion "Sandy MacQueen," who also has won similar honours, both at former Brisbane Shows and at shows in the South.

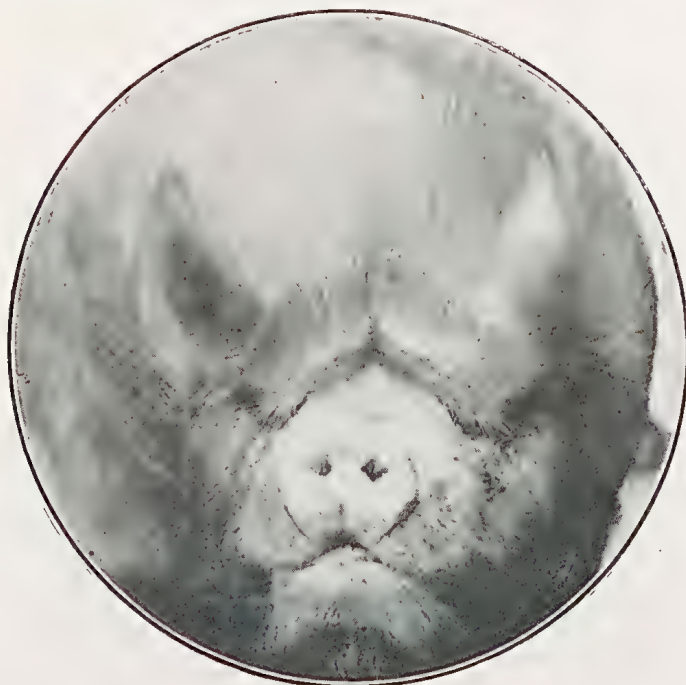


Fig. 1.

A well-known prize winner, Mr. W. J. Warburton's "Newington Adventurer" 2090, affectionately known at the Show as "Old Warby's Yorkio Champion." Bred originally at Newington State Hospital, N.S.W., he has won prizes both at Sydney and Brisbane Royal National Shows and seems content to carry on for another Show or two yet. His photograph denotes contentment and satisfaction in the extreme.

The Berkshires were a very even lot, though, apart from the champions and prize winners, the younger stock did not show that characteristic type and regular colour marking so desirable in this breed. The entries were augmented by a trio of twelve weeks old Berkshires from the stud of Luke Williams, of Tasmania, but even these would have shown to more advantage had they been marked strictly in accordance with the high standard set by the Berkshire and Yorkshire Society in whose herd-books they were registered, as were most of the prize-winning stock in the several breeds. Colour markings, while only a "fancy" point, are of considerable importance, so important indeed that the Society propose refusing registration of all Berkshires not coming up to the standard as adopted by them, and as originally determined by the British Berkshire Society. Type, too, is important, many of the Berkshires exhibited being plain and unattractive. However, Mr. Williams's

pigs sold well, and he is to be congratulated, not only on having exhibited Tasmanian Berkshires at Brisbane, but on having travelled overland in order to be in attendance at the Centenary Celebrations, the Show, and the Stud Sales. He is the Federal General Council representative for Tasmania of the Berkshire and Yorkshire Society.

Dealing with the various prize winners, the male championship was annexed by "Murray Glen Star" 4969 (illustrated on page 69 of August "Agricultural Journal"), the champion prize winner at Sydney Show last April, and purchased there for Queensland Agricultural High School and College, Gatton. This boar has developed well, and should prove a very valuable addition to the stud at Gatton. The second prize boar in the same class was L. S. Ducat's "Waterview Don" 5430, a well-known Northern Rivers, New South Wales, prize winner, and the second prize boar under six months old at Brisbane Show, 1923. Another boar in the same class was W. J. Warburton's "Northgate Prince," but he was unplaced.

"Murray Glen Star" had as a competitor in the finals W. J. Warburton's "Brentwood Star" 4373, a Sydney Show prize winner, who was awarded the reserve championship. His competitor in the two year old and over class was M. Porter and Son's "Rose Loch Jordy" 5852, who was placed second, but who a week later at Gympie Show came to his own, and annexed the champion ribbons presented by the Gympie Show Committee.

In the class Berkshire boar six months old and under twelve months, A. MacFarlane's "Frampton Jack" (Fig. 3, p. 235) romped home with first award. He was later purchased at 17 guineas to go to Kairi Stud Farm on the Atherton Tableland. The second prize went to "Gatton Joe," shown by Gatton College, and later purchased by Mr. F. Grau, of Atherton.

W. J. Warburton secured the several awards in the younger classes, as also first award for Berkshire boar and progeny, in which L. S. Ducat secured second place. The herd-book ribbon was awarded to the champion boar.

In Berkshire sows, Gatton College was again successful in securing the championship, this time with "Killarney Stella" 4249 (Fig. 2), the first prize sow with litter at last Sydney Show. She has made up into a very fine animal, and should be heard of again at future shows.



Fig. 2.

The Champion Berkshire Sow, Brisbane Show, 1924, "Killarney Stella" 4249, the property of Queensland Agricultural College and High School, Gatton. She also won first prize with litter, Sydney Show, 1924, and is an ideal type of breeding sow. Note the length and evenness of body and the fine skin and hair, characteristics which denote strength of constitution and robustness.

Her class mates were "Northgate Patience," a fine sow awarded reserve champion, and M. Porter and Son's "Rose Loch Model," who secured the female championship at Gympie Show, where Mr. Porter was the principal exhibitor in the pig section.

In Berkshire sows one year old and under two, L. S. Ducat, of Tweed Heads, New South Wales, secured both awards, his "Waterview Purity" 5219, being purchased for Kairi State Farm. Mr. Ducat also secured both awards in the class for sows under twelve months old, and in this class also the first prize sow, "Waterview Jewel," was purchased for Kairi. The second prize sow, "Brentwood Lorna," was of special merit. She was selected by Mr. R. G. Watson, on Mr. Ducat's behalf, at last Sydney Show, and should develop into a champion.

In the younger classes, the awards were as follows:—Sow under six months, Gatton College, "Cremorne Flurry" first; L. S. Ducat's "Waterview Ellie," second. The latter sow and three of her litter mates go to Kairi State Farm to help in increasing the Berkshire stud there.

In the class for pen of three Berkshire sows under sixteen weeks, Luke Williams, of Tasmania, was successful, and at the Stud Sales which followed these three sows, twelve weeks old, were sold as follows:—First pick to L. S. Ducat, of Tweed Heads, at 22 guineas, next lot to Goodna Hospital at 14 guineas, and the third sow to J. W. Handley, of Murphy's Creek, at 13½ guineas—record prices at Brisbane Show for pigs at this age.

W. J. Warburton, of Northgate, secured second award with neat attractive sows, while he also was successful in securing first award for sow and litter. The litter of eleven sold at an average of 6 guineas, and were much sought after. (Fig. 4.)



Fig. 4.

The first prize Berkshire sow and litter, Brisbane Show, 1924. A well-developed growing family that caught the buyer's eye and realised an average of six guineas a piece at the Stud Sales, which followed a day or two after the judging. The property of W. J. Warburton, of Northgate, who has had many champions.

The herd-book ribbon was awarded to Gatton College, with "Killarney Stella," the reserve champion being W. J. Warburton's "Northgate Patience."

Middle Yorkshires.

In this section, Mr. Warburton was the only competitor, and he secured the various awards, including both male and female champion and reserves. (Figs. 5

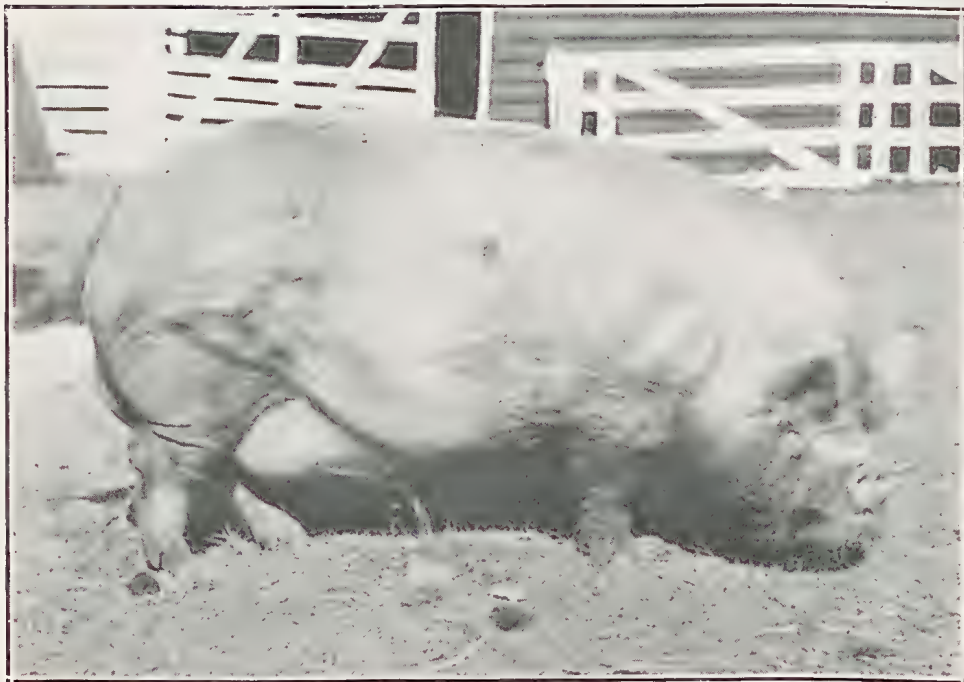


Fig. 5.

Another photograph of W. J. Warburton's Champion Yorkshire Boar, "Newington Adventurer" 2693. He shows great quality and is a reliable stock getter. His progeny have won numerous prizes.

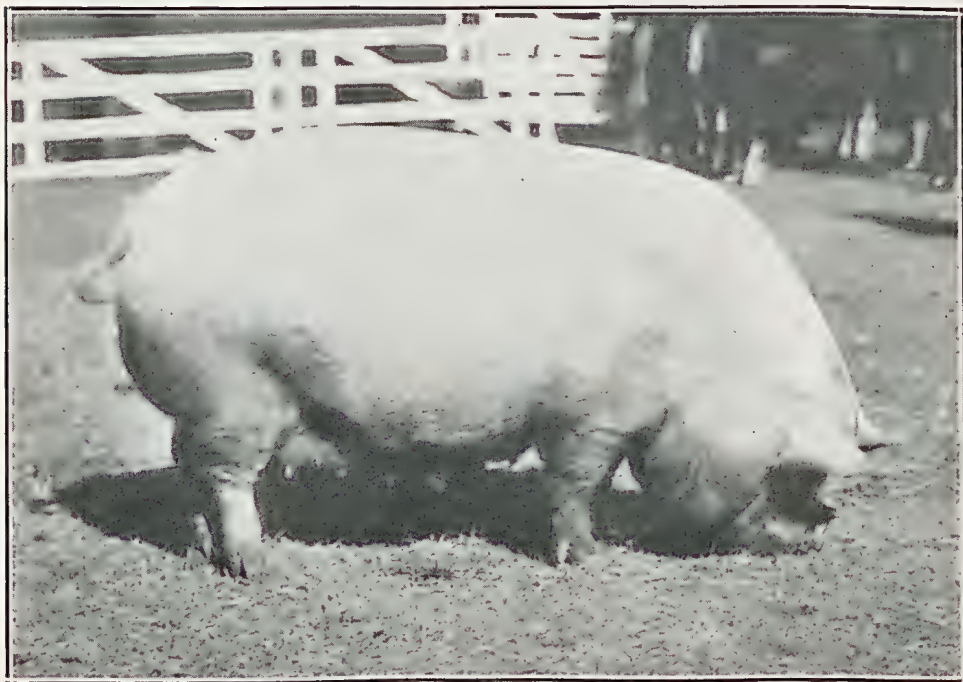


Fig. 6.

W. J. Warburton's Champion Middle Yorkshire Sow "Northgate Baroness 3rd," a wonderfully well developed matron, she has the maternal instincts strongly developed and has proved her worth in the production of healthy vigorous litters.

and 6.) He had some splendid-quality animals on show, and his efforts in keeping up the competition are to be commended, though, unfortunately, the Stud Sales do not show results, and it is evident that breeders generally are somewhat averse to introducing the white pigs. The Department also do not recommend them, except in cases where breeders have up-to-date accommodation, and can cater for the comfort of their pigs, so that they are protected both from the extremes of heat in the summer and severe weather during winter time.

Tamworths.

The Tamworth section was well filled; the quality was outstanding. The male championship was awarded to J. H. Whittaker's famous old "Sandy MacQueen," now past the allotted span (eight years) insofar as breeding is concerned. The reserve champion went to S. A. Farley, who had recently purchased his exhibit from Mr. Whittaker. In his class, this boar had as his keenest competitor, Gatton's "Blakeney Rex" 332, a useful young animal also purchased at Sydney in April. In the two year old and under class, the first prize boar was A. N. White's "Blakeney Romeo," who afterwards became the property of Mr. Whittaker, whose stud is situated at Broxburn on the Darling Downs. Mr. White deserves special mention for having brought a big team from Penrith, New South Wales, a long overland journey by rail, and accomplished without loss, except in time, as it is a rather protracted journey by mixed train.

In the younger classes, the awards were fairly evenly divided amongst the breeders named.

The championships were awarded in the male classes:—Champion boar, J. H. Whittaker's "Sandy MacQueen" 97, and reserve champion, S. A. Farley's "Broxburn Promise."

In the female classes, competition was keener, and the quality even more pronounced than in the male classes. In aged sows, Gatton College secured the championship with an ex-Sydney champion, "Rosebank Rosy Queen" 113. (Fig. 7.)



Fig. 7.

Champion Tamworth Sow, Brisbane Show, 1924. "Rosebank Rosy Queen" 113, the property of Queensland Agricultural High School and College, Gatton. She also won the Championship at Sydney Show, 1924, and was bred at the Hawkesbury Agricultural College, Richmond, N.S.W. Note the deep, compact, well-proportioned body and the fleshy ham.

She also had as a runner-up another Sydney prize winner, J. H. Whittaker's "Manning Ruby" 161, originally bred on the Manning River, New South Wales, by Fred. S. Martin. There were other excellent quality sows in this class, all prolific useful types. The reserve champion went to A. N. White's "Blakeney Ribbons," a sow bred at the Hawkesbury College, New South Wales, and at the time of judging under offer to a firm of New Zealand breeders.

Another Hawkesbury sow secured second award; she was the property of Gatton College. Messrs. White and Whittaker secured the balance of the awards in the younger classes, whilst Mr. Whittaker won both awards in the class for sow and litter. (Fig. 8.)



Fig. 8.

J. H. Whittaker's first prize Tamworth Sow and Litter, Brisbane Show, 1924. The sow, "Broxburn Lass" 344, is from a well known prize-winning sow, "Manning Ruby" 161, the litter being sired by "Sandy MacQueen" 97, champion Tamworth boar at same show, and an old champion at Southern Shows.

The herd-book ribbons were later presented to the winners of the championships.

Poland-Chinas.

The showing of "Polands" was unique in that they were all from New South Wales, excepting those shown by Mr. J. H. Whittaker. They were purchased in Sydney, but had the benefit of a three months' spell on his Darling Downs property, and had thus become Queenslanders. The exhibits in this section were all good-quality pigs with but one or two exceptions, though some of the younger stock might have shown better growth.

Gatton College were unfortunate in losing their entry in Poland-China boars, as he died in transit, from Gatton to Brisbane, though only three months prior to his death he had travelled in crate from Sydney.

The male championship was awarded to A. N. White's "Blakeney Rebel" 146. (Fig. 9.) The reserve champion was also a very fine boar, "Boynes Wood Judge"

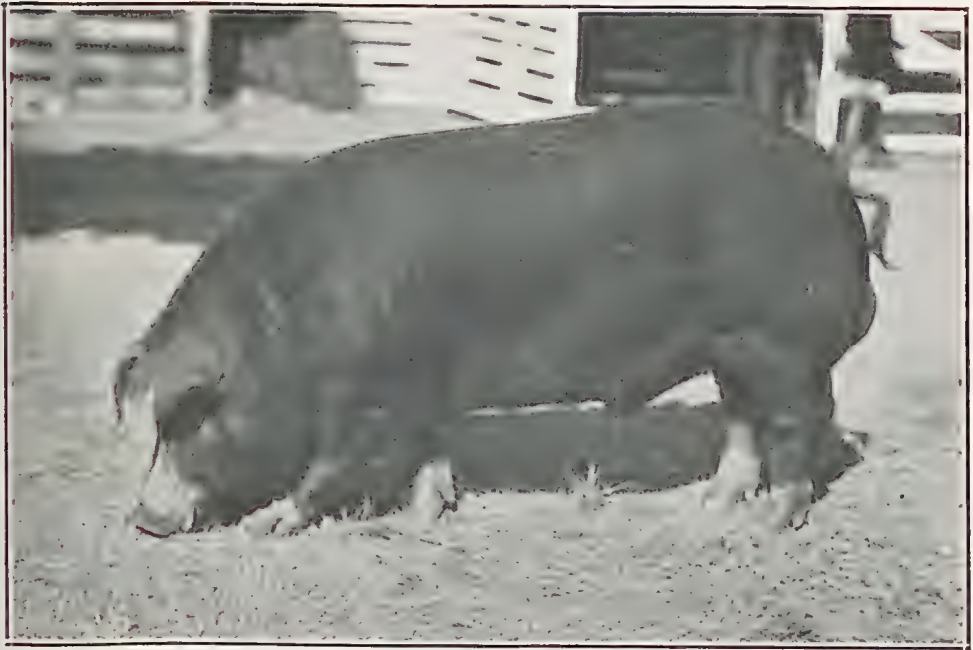


Fig. 9.

A. N. White's Champion Poland-China Boar, "Blakeney Rebel" 146, Brisbane Show, 1924. The modern Poland-China is marked in much the same way as the Berkshire, though more variation from the most desirable marking is allowed in the Poland-China. This boar is quite characteristic of the type.



Fig. 10.

Messrs. Yalden Brothers' Reserve Champion Poland-China Boar, Brisbane Show, 1924, "Boynes Wood Judge" 136. Note the fine quality skin and hair; the photograph was taken after a good deal of trouble as this boar was most active and vigorous. He has since travelled per steamer to Cairns, thence to Atherton, having been purchased for Messrs. Halliday and Townsend, of East Barron.

136 (Fig. 10), the property of Messrs. Yalden Brothers, of Cowper, New South Wales, who also owned the other boar in this class, "Boynes Wood Sydney." Both these latter boars were purchased by the writer for Atherton Tableland buyers. In the class under twelve months, Mr. White's "Blakeney Royal" won first, and J. H. Whittaker's "Broxburn Liberator" second award.

Messrs. Yalden Brothers, who also deserve special mention for coming from the Northern Rivers (with Mr. L. S. Ducat, a Berkshire breeder) to exhibit their stud pigs here, were successful in securing both awards in the class for boars under six months old. In the female classes, Gatton College again secured a championship, this time with "Danesboro Winnie" (Fig. 12), a sow the writer selected at Sydney after winning first prize with litter there last Easter.

The reserve champion sow was found in the under twelve months class, her name "Blakeney Revenue" indicating productive powers of the first order. Her class mate, "Blakeney Rapture," who secured second award, accompanies her to Atherton, being selected for Tableland farmers, who are keen on Poland-Chinas. In the under six months class, a neat little sow, "Broxburn Playmate," who also goes to Atherton, secured first award, while "Blakeney Renown," who secured second award, goes back to New South Wales for future shows there. One of the "Playmate's" sisters, "Broxburn Trixie" (both, by the way, daughters of the champion sow) goes to Messrs. Grogan Brothers, of Babinda, North Queensland, to introduce the type there. There were fewer entries in the younger classes in this than in any of the other breeds, except

Duroc-Jerseys.

in which only a very small showing was made by Messrs. Brown Brothers, of Moorombin, Toogoolawah.

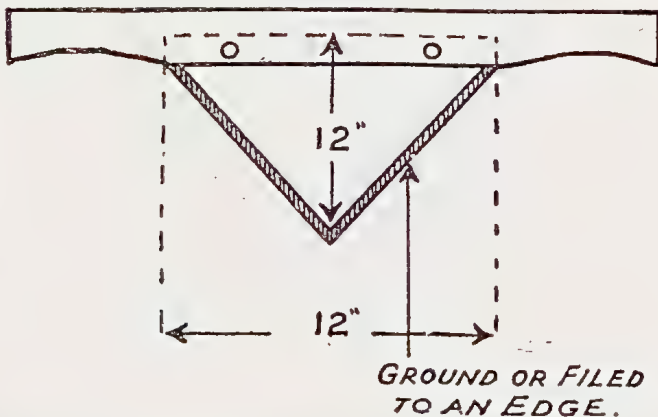
The stud pig classes were judged by Mr. A. F. Gray, Piggery Instructor of the Hawkesbury College, Richmond, New South Wales, whilst the writer judged the

Bacon Pigs

in which there was a fair entry. The awards in this section were:—First prize, H. B. Baldwin; second and third, Gatton College.

KEROSENE TIN OPENER.

The kerosene tin on the farm is a very useful thing, and the device about to be described will be found to be much more expeditious in removing the tops than laboriously cutting out with snips or ordinary tin opener.



First secure a piece of old circular saw, or failing that, have a piece of tool steel cut to dimensions as per sketch; the gauge does not want to be too heavy. Secure same to a piece of 3 x 1 by using two or three 1-inch stove bolts. To operate, place the point as near as possible equal distance from either edge and as close to the side of the tin as possible, and force down. Repeat the operation on the other three sides, and the top will then fall in.

STUD PIGS FOR ATHERTON TABLELAND.

IMPORTANT PURCHASES AT BRISBANE SHOW.

E. J. SHELTON, H.D.A., Instructor in Pig Raising.

In order to further cater for the increasing demand for breeding stock on the Atherton Tableland a number of additional Berkshire pigs were purchased at the recent Royal National Show stud pig sales for the Kairi State Farm. These pigs have since been shipped north, and latest advices are to the effect that they arrived in excellent condition and are settling down nicely in their new home. The writer's recent visit to the Atherton district, coupled with the increasing activities of the Pig Pool Board consequent on the opening of the Bacon Factory at Floreat Siding, Mareeba, and later, special representations which were made by Messrs. C. W. Roseblade, chairman of the Pig Pool Board, and Mr. E. H. Heale, of Malanda, to the Minister for Agriculture (Hon. W. N. Gillies) have been responsible for these purchases; and, now that the Tableland pig industry is on a sound financial basis, farmers in those districts are realising the great possibilities attaching to the extensive development of pig-raising there.

Included in the purchases for Kairi State Farm were the boar "Frampton Jack" (Fig 3), bred by MacFarlane Brothers, of "Kilbirnie," Radford. This boar's



Fig. 3.

Berkshire Boar, "Frampton Jack." First prize Boar, in class under 12 months old, Brisbane Show. Purchased at 17 guineas for Kairi State Farm, North Queensland. A good, useful quality sire.

breeding traces back to the famous "Onward," a Berkshire sire many times champion in Queensland. "Frampton Jack" won first prize in his class. The sows included an excellent selection of seven head from the stud of L. S. Ducat, of Tweed Heads, N.S.W., and two selected sows from the stud of W. J. Warburton, of Northgate, Queensland.

Of Mr. Ducat's sows probably the best sow was "Waterview Jewel," sired by a well-known prize-winner, "Cremorne Chief" 4346 and from "Britannia Ruby" 4176. This sow won first prize in her class in good competition, including the second-prize sow "Brentwood Lorna," a daughter of that well-known prize-winning sow "Topsy of Yarra." Another sow, same age and purchased at same price—viz., 15 guineas—was "Waterview Purity" 5219, whose dam is "Britannia Flo" 4175. "Waterview Flora" was also selected. She is also from "Britannia Flo" 4175, but is six months younger than "Waterview Purity."

Of the younger sows four were selected from the litter of "Britannia Ruby" 4176. Two of these were shown in the under six months class and one of them, "Waterview Ellie," secured second prize. These young sows should develop into very useful breeding stock. They come from a well-known, prolific, quick-growing type, and though somewhat plain are first-class breeders. Mr. Warburton's sows, "Northgate Dorothy" and "Northgate Select," are sired by the reserve champion boar "Brentwood Star" 4374 and are from one of this owner's best stud sows, "Rightaway Maid. 3rd" 4198. They were six months old and were well marked and of good type.

Other Consignments for the North.

Apart altogether from the purchase for Kairi State Farm, a number of pigs were selected for and by Atherton Tableland and Cairns Hinterland buyers. These have also been shipped north, and it is hoped will be the means of assisting in improving the class of stock in those districts. The purchases included—

Poland-China boar and sow for Messrs. Halliday and Townsend, of East Barron, *viâ* Atherton. In this selection it is noteworthy that the boar selected, "Boynes Wood Judge" (Fig. 10), bred by Messrs. Yalden Brothers, of Cowper, New South Wales, won reserve champion in keen competition; the sow "Blakeney Rapture" 159 winning second prize in her class; she was in pig at time of purchase, and should prove a valuable addition to the stud of these breeders.



Fig. 11.

A. N. White's Reserve Champion Poland-China Sow, "Blakeney Revenue," Brisbane Show, 1924, since purchased for Mr. Jack Lawrence, Pearamon, North Queensland. She should develop into an excellent breeder. She was in the under twelve months' class and has since farrowed.

Poland-China boar and sow for Jack Lawrence, of Mackenzie road, Pearamon, *viâ* Cairns and Kairi. In this case the sow selected, "Blakeney Revenue" 164, sold on account of A. N. White, of Penrith, New South Wales, the vendor also of "Blakeney Rapture" 159, won reserve champion in a good class. The boar was a runner-up and appeared to be of excellent type and quality, active and vigorous, extremely energetic. The pedigrees of these pigs trace back to imported blood on both sides.

Poland-China sow for Mr. Robert Gordon, of Glen Villa, Atherton: This sow, "Broxburn Playmate," sold on account of J. H. Whittaker, of Broxburn, Darling Downs (the vendor also of the sow "Broxburn Trixie," referred to below), won first prize in her class and was of very even quality, having a soft silky skin and fine glossy hair. They were both daughters of the champion sow, "Danesboro Winnie" 130 (Fig. 12), the first-prize sow with litter at Sydney Show, 1924:



Fig. 12.

Gatton College Champion Poland-China Sow, "Danesboro Winnie" 130, bred at the Hawkesbury Agricultural College, Richmond, N.S.W. She also won first prize with litter, Sydney Show, 1924, and is a typical specimen of the most popular strains of this American breed. Note the characteristic marking and the indications of quality generally.

Berkshire boar and Poland-China sow for Messrs. Grogan Brothers, butchers, of Babinda, *via* Cairns. The boar selected for these breeders was "Waterview Don" 5430, the second-prize boar under two years old. This boar's prize record includes second at Brisbane Show, 1923 (when under six months old), first, Murwillumbah, under nine months old, and first and special at same show for best Berkshire boar in the Tweed River district. He comes of a well-recognised prize-winning strain and has sired many prize-winners. The Poland-China sow "Broxburn Trixie" is referred to above.

Tamworth boar and sow for Mr. E. H. Heale, of Kureen, near Malanda. The boar "Blakeney Riverdale," selected by Mr. Heale, who was present at the Show, is sired by the first-prize boar "Blakeney Romeo" 364 and is from a first-class sow "Blakeney Rita" 330. He was one of the first-prize pen of boars under four months old.

The Tamworth sow selected, "Blakeney Regina" 370, was sired by "Rossmore Jack" 233, a son of the champion boar "Sandy Maequeen" 97 and from a champion winner at Sydney Show.

This pair of Tamworths were of first quality and will be a welcome addition to the studs on the Tableland.

Berkshire boar for Mr. F. Grau, at Atherton. Mr. Grau was also present at the Show and selected the second-prize boar under twelve months old, "Gatton Joe," bred by the Queensland Agricultural High School and College, Gatton. He also is a useful-quality boar, coming from a tested strain.



PLATE 75.—*LUCUMA AMORPHOSPERMA*.

A tree in the Imbil rain forest. The tree on the extreme right of the picture is *Endiandra compressa*.

QUEENSLAND TREES.

By C. T. WHITE, F.L.S., Government Botanist, and W. D. FRANCIS,
Assistant Botanist.

Lucuma amorphosperma is found in the scrubs or rain forests from Imbil to as far north as Mount Dryander, near Proserpine. Like nearly all species of the Natural Order Sapotaceæ, to which this tree belongs, the bark when cut exudes a milky juice.

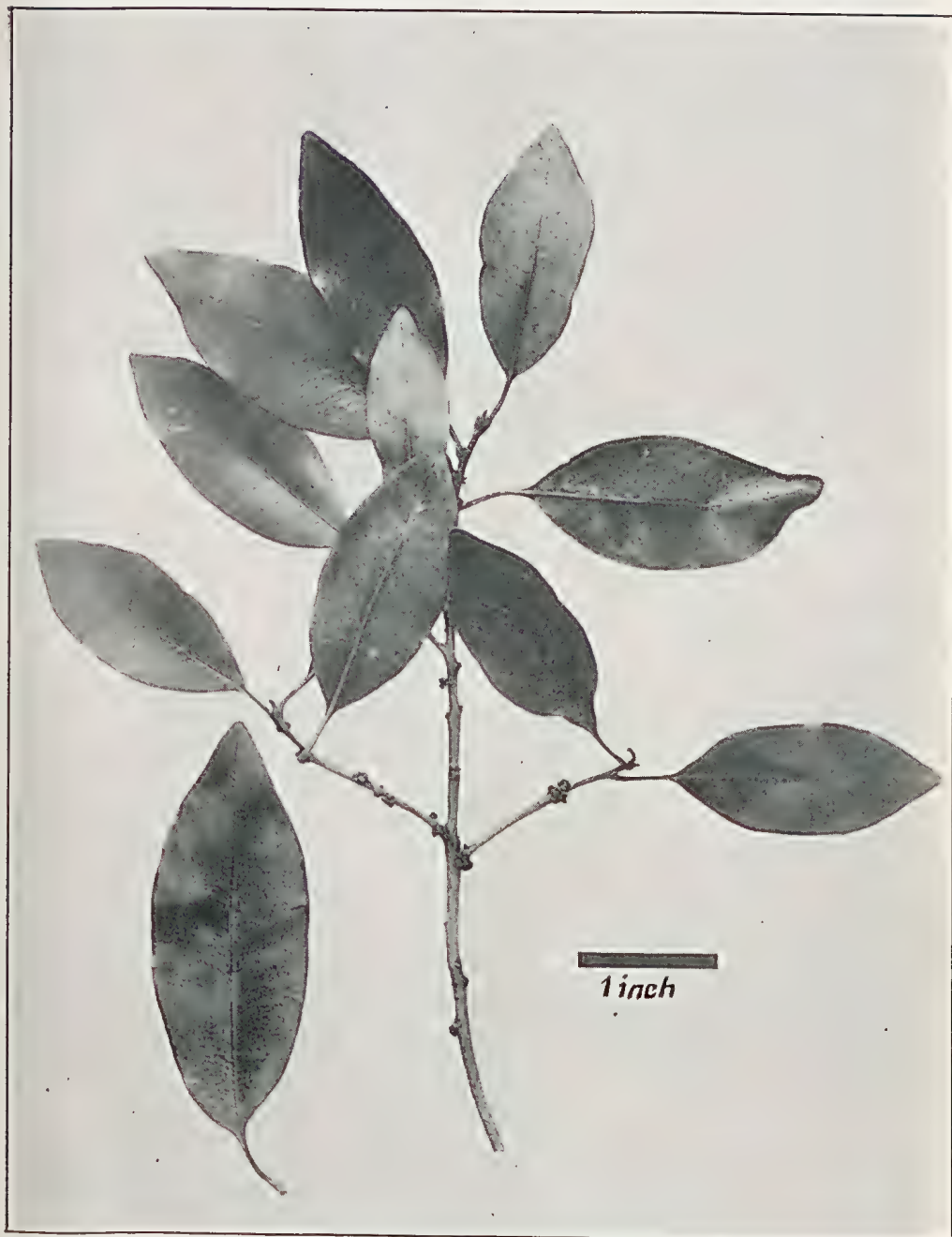


PLATE 76.—*LUCUMA AMORPHOSPERMA*.

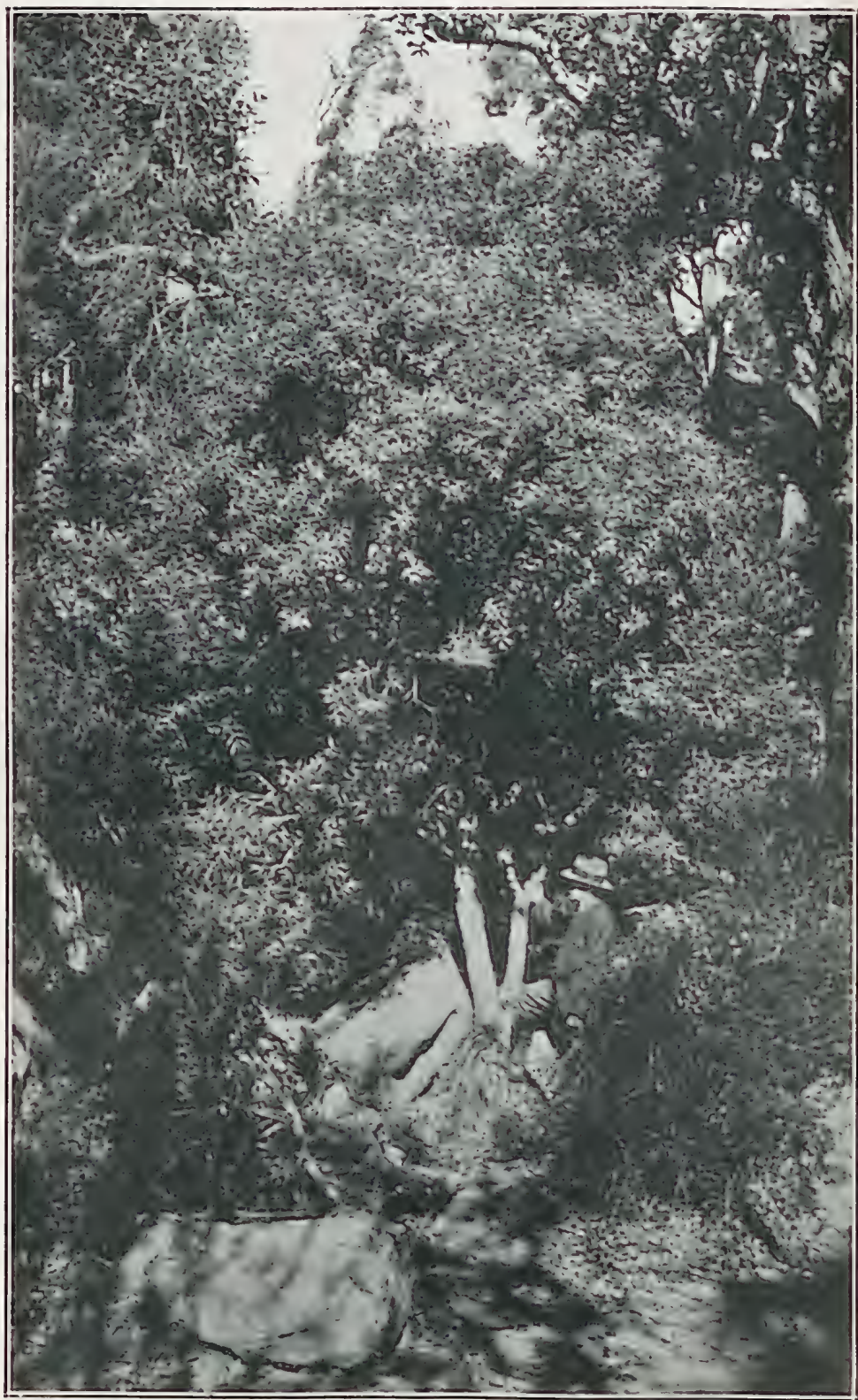


Photo. J. Henderson.]

PLATE 77.—THE SOUTHERN OLIVE (*Noëlela longifolia*, var. *velutina*).

THE SOUTHERN OLIVE (*Notelaea longifolia*, var. *velutina*).**A Native Plant Harbours Fruit Fly Larvæ in the Stanthorpe District.**

Another native fruit fly host has been discovered in the Stanthorpe district. The tree is known as the Southern Olive. Recently fruit fly larvæ were found in its fruit, but their exact species has not yet been determined. The following description of the tree and its fruit, courteously supplied by the Government Botanist, Mr. C. T. White, F.L.S., will enable orchardists to recognise it.

Description.—A small tree mostly growing in warm sheltered gullies, the branchlets and leaves covered with a fine close covering of short silky hairs. Leaves narrowed at both ends, $2\frac{1}{2}$ to 4 in. long and $\frac{1}{2}$ to 1 in. wide in the middle, the under surface closely covered with a velvety covering of short hairs, the upper surface less hairy. Flowers borne in short bunches (panicles) in the leaf-axils, fruits bluish-black, the size and shape on an ordinary pea, containing one more or less rounded seed slightly under $\frac{1}{4}$ inch in diameter.

Distribution.—*Notelaea longifolia* in its normal form has a wide distribution in the coastal "brushes" or "scrubs" of New South Wales and Queensland; the variety *velutina* distinguished by being clothed with a covering of short silky hairs. velvety to the touch is found in the warmer sheltered gullies of the Warwick, Stanthorpe, and Killarney districts.

Derivation of Botanical Name.—The name *Notelaea* comes from the Greek *notos* the south, and *claia* an olive, literally meaning "Southern Olive," the plant belonging to the Olive family; *longifolia*, from the Latin *longus* long and *folium* a leaf; *velutina*, Latin meaning velvety.

Common Names.—The name "Southern Olive" is suggested. The name "Native Olive" is already commonly applied to another Australian tree of the Olive family.



Photo, J. Henderson.]

PLATE 78.—THE SOUTHERN OLIVE.

MOUNT GRAVATT EGG-LAYING COMPETITION.**REPORT FOR AUGUST, 1924.**

During August a marked laying improvement was noted. The following are the individual scores, showing that a general average, per bird, of 22.5 eggs has been obtained.

SECTION 1.**LIGHT BREEDS.**

Name.	Breed.	A.	B.	C.	D.	E.	F.	Month.	Total.
W. and G. W. Hindes	White Leghorns	104	109	99	106	102	96	151	616
Oakleigh P. F.	Do.	87	107	89	83	100	98	136	564
W. H. Flowers	Do.	63	81	105	92	114	105	145	560
J. J. McLachlan	Do.	30	103	105	75	84	63	144	559
H. T. Britten	Do.	96	105	77	88	24	82	115	550
H. Fraser	Do.	104	89	85	109	76	85	154	548
W. D. Melrose	Do.	60	101	109	96	83	65	120	532
Mrs. L. Anderson	Do.	94	84	90	82	88	92	142	530
S. K. Grenier	Do.	72	80	103	86	86	89	151	528
J. E. G. Purnell	Do.	89	74	83	91	92	98	130	527
A. Sterling	Anconas	84	98	103	90	65	86	126	526
Kidd Bros.	White Leghorns	101	105	52	98	81	83	133	520
Mrs. R. E. Hodgo	Do.	100	93	66	98	86	73	127	516
L. Bird	Do.	98	104	86	43	93	90	141	514
T. W. Honeywill	Do.	90	103	79	79	95	65	125	511
R. C. Turner	Do.	100	96	64	88	57	103	139	508
T. H. Craig	Do.	84	82	79	94	60	104	153	503
G. W. Cox	Do.	82	63	97	59	108	88	142	497
G. Marks	Do.	108	75	74	68	76	79	147	480
A. Neil	Do.	95	90	80	92	48	74	133	479
W. Wakefield	Do.	19	94	91	76	89	103	138	472
L. J. Silman	Do.	93	89	80	67	74	64	128	467
T. W. Biddulph	Do.	104	91	43	78	63	84	126	463
Chris. A. Goos	Do.	3	102	81	101	83	82	105	452
H. P. Clarke	Do.	64	69	74	86	82	61	130	436
B. Driver	Do.	70	56	48	106	84	67	148	431
W. McHardie	Anconas	79	71	56	76	71	73	128	426
J. W. Newton	White Leghorns	81	65	65	58	81	64	129	414
Geo. Williams	Do.	79	40	70	67	73	60	119	389
Ancona Club, Pen No. 1	Anconas	51	67	70	87	58	17	96	350
Ancona Club, Pen No. 2	Do.	70	72	39	53	63	53	117	350

SECTION 2.**HEAVY BREEDS.**

J. Hutton	Black Orpingtons	96	123	102	92	99	97	166	609
J. Potter	Do.	103	113	85	79	105	82	125	567
Carinya Poultry Farm	Do.	83	60	104	91	82	97	152	517
W. and G. W. Hindes	Do.	72	83	85	91	114	71	145	516
E. Walters	Do.	40	53	76	120	123	97	158	514
Kidd Bros.	Do.	74	55	86	78	104	71	129	468
R. Burns	Do.	84	73	78	77	68	78	153	458
Mrs. A. E. Gallagher	Do.	61	92	73	69	71	71	152	437
F. W. Lenny	Do.	91	47	96	58	55	83	132	430
H. M. Challie	Do.	66	71	85	72	101	32	99	427
H. G. Stevens	Do.	65	75	54	76	51	81	164	402
Mrs. A. Kent	Do.	79	98	44	54	48	78	116	401
J. Ferguson	Do.	36	73	88	74	59	69	149	399
E. C. Stead	Wyandottes	14	84	42	53	28	60	140	281

P. RUMBALL, Supervisor.

N.U.P.B.A. COMPETITION, ZILLMERE.

Following are the results of the egg-laying at the above competition for the month of August. The average per bird in the three sections was—White Leghorns 21.7, Black Orpingtons 21.6, other varieties 23.3, and for the whole competition 21.8 eggs.

The weighing of birds and eggs has been completed, and birds failing to reach the standard weight have the letter "B" marked against their score, while those laying under the 2-oz. egg are indicated with an "E."

A regrettable occurrence was the death during the month of Mr. T. Brotherton's Black Orpington No. 124, which was running second in her section, and had only a few weeks previously been awarded the President's Gold Medal for the most typical bird in the competition.

WHITE LEGHORNS.

Pen No.	Owner.	Weight Egg.	August.	Total.
		Oz.		
104	Oakleigh P.F. ..	2.07	28	125
97	K. A. Sommerlad ..	2.16	25	110
105	Oakleigh P.F. ..	2.01	25	109
20	A. Hodge ..	2.04	23	107
21	A. Hodge ..	2.13	25	107
82	W. Wakefield ..	2.19	25	105
84	W. Wakefield ..	2.13	21	105
103	Oakleigh P.F. ..	1.98	21	105
19	A. Hodge ..	2.07	22	102
78	M. F. Newberry ..	2.01	24	102
6	H. T. Pember ..	2.08	24	98
76	M. F. Newberry ..	2.02	25	98
89	R. Duff ..	2.15	23	97
95	G. Williams ..	2.01	23	97
12	W. J. Berry ..	1.97	26	95
88	R. Duff ..	2.05	25	95
90	R. Duff ..	1.99	24	94
60	A. Staib ..	2.08	16	91
79	J. Purnell ..	2.10	25	91
16	J. T. Webster ..	2.07	23	88
48	H. C. J. Turner ..	2.15	23	88
64	E. Tracey ..	2.06	21	86
92	C. A. Hodgson ..	2.03	23	86
25	H. T. Britten ..	2.14	24	85
41	R. C. Cole ..	2.23	23	85
68	Kidd Bros. ..	2.16	23	85
93	C. A. Hodgson ..	2.05	20	85
46	R. C. J. Turner ..	2.18	22	84
73	E. C. Raymond ..	2.16	22	84
101	A. S. Walters ..	2.18	24	84
38	H. Fraser ..	2.25	23	82
100	A. S. Walters ..	1.99	22	82
11	W. J. Berry ..	2.24	28	80
1	F. J. Williams ..	2.04	22	79
39	H. Fraser ..	2.22	24	78
61	Carinya P. F. ..	2.20	24	78
174	S. L. Grenier ..	2.01	24	78
58	A. Staib ..	2.11	24	77
40	R. C. Cole ..	2.14	23	76
80	J. Purnell ..	2.11	21	76
13	G. Marks ..	2.25	22	75
56	J. Hutton ..	2.13	22	74
65	E. Tracey ..	2.05	15	73
74	E. C. Raymond ..	2.16	21	73
99	K. A. Sommerlad ..	2.27	23	73
15	G. Marks ..	2.21	27	72
51	J. Earl ..	2.02	24	72
106	W. L. Howard ..	2.14	23	72
87	Enroh Pens ..	2.02	19	69
45	P. F. Adams ..	2.45	20	67
108	W. L. Howard ..	2.03	24	67
86	Enroh Pens ..	2.29	17	66
98	K. A. Sommerlad ..	2.14	22	66

WHITE LEGHORNS—*continued*.

Pen No.	Owner.	Weight Egg.	Oz.	August.	Total.
107	W. L. Howard	2.17	..	23	.. 62
10	W. J. Berry	2.20	..	23	.. 61
44	P. F. Adams	2.31	..	23	.. 61
47	R. C. J. Turner	2.26	..	26	.. 57
62	Carinya P.F.	2.17	..	22	.. 54
26	H. T. Britten	2.02	..	19	.. 53
59	A. Staib (Replace, 12-6-24) ..	2.07	..	22	.. 53
83	W. Wakefield	2.01	..	16	.. 53
69	Kidd Bros.	2.05	..	20	.. 52
63	Carinya P.F.	2.37	..	24	.. 49
5	H. T. Pember	2.18	..	24	.. 46
34	J. L. Chapman	2.10	..	22	.. 43
172	S. L. Grenier	2.05	..	19	.. 43
91	C. A. Hodgson	2.12	..	18	.. 42
17	J. T. Webster	2.09	..	—	.. 20
94	G. Williams	—	..	—	.. 4
67	Kidd Bros.	1.99	..	22	.. B100
30	M. H. Campbell	2.07	..	23	.. B98
35	J. L. Chapman	2.13	..	21	.. B93
71	J. R. Wilson	1.98	..	23	.. B93
52	G. E. Rogers	2.05	..	22	.. B90
75	E. C. Raymond	2.04	..	23	.. B90
28	M. H. Campbell	2.06	..	20	.. B88
29	M. H. Campbell	2.01	..	22	.. B87
42	R. C. Cole	2.16	..	22	.. B85
49	J. Earl	2.07	..	17	.. B85
14	G. Marks	2.13	..	27	.. B77
77	M. F. Newberry	2.16	..	23	.. B57
72	J. R. Wilson	2.00	..	22	.. B56
33	W. and G. W. Hindes ..	1.97	..	23	.. B54
24	A. Neil	2.06	..	17	.. B49
173	S. L. Grenier	2.02	..	13	.. B34
7	H. Sturman	2.00	..	17	.. B28
85	Enroh Pens	1.83	..	22	.. BE115
54	G. E. Rogers	1.89	..	22	.. E103
55	J. Hutton	1.86	..	27	.. BE101
70	J. R. Wilson	1.76	..	28	.. BE101
66	E. Tracey	1.93	..	22	.. BE99
81	J. Purnell	1.96	..	23	.. E95
102	A. S. Walters	1.93	..	12	.. E93
27	H. T. Britten	1.92	..	19	.. E92
31	W. and G. W. Hindes ..	1.87	..	26	.. BE91
32	W. and G. W. Hindes ..	1.96	..	23	.. BE88
18	J. T. Webster	1.94	..	21	.. BE86
36	J. L. Chapman	1.96	..	25	.. E83
53	G. E. Rogers	1.90	..	25	.. E81
57	J. Hutton	1.81	..	24	.. BE79
22	A. Neil	1.86	..	17	.. BE78
23	A. Neil	1.88	..	23	.. BE71
8	H. Sturman	1.96	..	20	.. E70
37	H. Fraser	1.89	..	25	.. BE69
9	H. Sturman	1.95	..	25	.. BE68
2	F. J. Williams	1.85	..	22	.. E67
3	F. J. Williams	1.84	..	20	.. E64
96	G. Williams	1.90	..	21	.. BE63
4	H. T. Pember	1.94	..	23	.. E55

BLACK ORPINGTONS.

126	T. Brotherton	2.02	..	26	.. 130
127	E. Walters	1.98	..	29	.. 124
110	T. Fanning	2.07	..	25	.. 120
130	G. E. Rogers	1.97	..	27	.. 120
116	G. L. Campbell	2.07	..	23	.. 118
156	J. Hutton	2.14	..	20	.. 118
129	E. Walters	1.97	..	27	.. 114
144	F. P. Cummings	2.40	..	23	.. 111
113	W. R. Wilson	2.27	..	24	.. 107

BLACK ORPINGTONS—*continued*.

Pen No.	Owner.	Weight Egg. Oz.	August.	Total.
145	Everlay P.Y.	2.24	29	107
143	F. P. Cummings	2.11	19	106
155	J. Hutton	2.03	20	106
111	T. Fanning	2.26	25	105
131	G. E. Rogers	2.06	25	103
133	C. C. Dennis	2.11	22	102
139	J. Pryde	2.19	23	101
150	E. C. Raymond	2.02	24	93
120	H. M. Chaille	2.13	20	90
125	T. Brotherton	2.15	24	90
128	E. Walters	2.25	19	87
153	Enroh Pens	2.01	18	85
132	G. E. Rogers	2.01	19	80
134	C. C. Dennis	2.17	21	78
148	E. C. Raymond	2.04	19	77
149	E. C. Raymond	2.16	18	77
146	Everlay P.Y.	1.98	24	76
112	W. R. Wilson	2.01	22	74
137	W. S. Adams	2.02	28	69
152	Enroh Pens	1.99	21	62
118	H. M. Chaille	2.01	18	55
121	J. Potter	2.01	12	45
141	J. Pryde (Replace, 7-7-24) ..	1.98	23	33
124	T. Brotherton (Replace, 30-8-24)	—	2	2
119	H. M. Chaille	2.02	2	B81
114	W. R. Wilson	1.85	26	E126
115	G. L. Campbell	1.89	23	E118
117	G. L. Campbell	1.93	22	E114
138	W. S. Adams	1.95	27	BE112
142	T. P. Cummings	1.93	27	E112
147	Everlay P.Y.	1.83	25	E111
154	J. Hutton	1.96	17	E108
109	T. Fanning	1.94	23	E105
123	J. Potter	1.83	25	E96
136	W. S. Adams	1.70	19	E89
122	J. Potter	1.92	—	E78
140	J. Pryde	1.92	27	E78
151	Enroh Pens	1.82	23	E62
135	C. C. Dennis	1.87	16	E57

OTHER VARIETIES.

169	J. Pryde, Lang.	2.06	31	91
159	Messines P.F., R.I.R.	2.18	21	88
167	W. H. Forsyth, S.W.	2.24	22	88
158	Messines P.F., R.I.R.	2.12	26	77
160	T. C. Ollier, B.R.	2.14	26	77
168	W. H. Forsyth, S.W.	2.08	26	76
161	T. S. Ollier, B.R.	2.18	31	72
165	A. S. Walters, B.R.	2.01	23	69
180	J. Ferguson and Son, B.L. ..	2.06	25	69
166	W. H. Forsyth, S.W.	2.15	17	67
157	Messines P.F., R.I.R.	2.18	23	59
164	A. S. Walters, B.R.	2.16	20	59
178	J. Ferguson and Son, B.L. ..	1.97	21	48
176	Everlay P.Y., B.L.	2.05	20	36
163	A. S. Walters, B.R. (Replace, 3-7-24)	2.13	24	28
170	J. Pryde, Lang. (Replace, 23-6-24)	2.16	23	B48
175	Everlay P.Y., B.L.	1.86	24	E81
162	T. C. Ollier, B.R.	1.96	28	E64
171	J. Pryde, Lang. (Replace, 21-6-24)	1.86	25	E47
177	Everlay P.Y., B.L.	1.76	20	E41
179	J. Ferguson and Son, B.L. ..	1.72	13	E30

C. KIDD, Hon. Secretary.

N.U.P.B.A., TOOWOOMBA SUB-BRANCH.**Single Test Egg-laying Competition—Scores to 31st July, 1924.****BLACK ORPINGTONS.**

Pen No.	Owner.	July.	Total.	Pen No.	Owner.	July.	Total.
2	Hutton, Jas. . .	24	100	10	Everlay Poultry Farm	23	69
29	Adams, W. S. . .	27	98	21	Walsh, H. . .	21	67
52	Holmes, R. . .	25	96	19	Maund, Mrs. L. . .	21	65
11	Webb, A. W. . .	27	91	50	Ollier, T. C. . .	26	64
9	Everlay Poultry Farm	23	90	6	Walters, E. . .	22	62
28	Williams, W. D. . .	21	90	13	Burns, R. . .	20	62
51	Holmes, R. . .	24	89	27	Williams, W. D. . .	19	62
24	Carr, T. J. . .	22	86	25	Stephens, Moss . .	14	60
33	Potter, Jas. . .	21	85	44	Smith, E. R. . .	8	59
42	Wilson, W. R. . .	17	85	36	Rivett, R. R. . .	18	59
22	Walsh, H. . .	25	84	37	Short, J. W. . .	22	59
45	Stephens, H. B. . .	27	83	30	Adams, W. S. . .	22	54
20	Maund, Mrs. L. . .	22	82	48	Head, J. . .	21	46
23	Carr, T. J. . .	21	81	16	Macfarlane, K. . .	17	43
49	Ollier, T. C. . .	23	79	14	Burns, R. . .	19	41
40	Rogers, G. E. . .	22	78	46	Stephens, H. B. . .	7	41
41	Wilson, W. R. . .	22	78	35	Rivett, R. R. . .	6	39
5	Walters, E. . .	22	77	34	Potter, Jas. . .	15	37
7	Adams, P. F. . .	29	77	47	Head, J. . .	3	37
31	Radford, G. . .	22	75	4	McLay, J. A. . .	7	35
32	Radford, G. . .	25	74	17	Champion, S. H. K. . .	3	33
15	Macfarlane, K. . .	23	74	26	Stephens, Moss . .	21	26
43	Smith, E. R. . .	24	73	8	Adams, P. F. . .	4	24
3	McLay, J. A. . .	21	72	38	Short, J. W. . .	21	21
1	Hutton, Jas. . .	23	71	18	Champion, S. H. K. . .	16	17
39	Rogers, G. E. . .	18	70	12	Webb, A. W. . .	0	16

OTHER VARIETIES.

Pen No.	Owner.	July.	Total.	Pen No.	Owner.	July.	Total.
60	Le Pla, A. W. (R.I.R.)	23	92	71	Brand, V. (R.I.R.) . .	5	56
59	Le Pla, A. W. (R.I.R.)	22	90	64	Rafter, J. J. (B.L.) . .	7	53
70	Dibbs, H. (Lang.) . .	24	88	54	Warrian, C. G. (Rks.)	25	45
53	Warrian, C. G. (Rks.)	25	83	58	Maund, Mrs. L. (Col. W'dottes) . .	17	30
66	Becker, W. (Lang.) . .	18	80	62	Harrington, J. (B.L.)	14	29
57	Maund, Mrs. L. (Col. W'dottes) . .	26	72	63	Rafter, J. J. (B.L.) . .	12	26
61	Harrington, J. (B.L.)	20	71	72	Brand, V. (R.I.R.) . .	12	21
56	Carr, T. J. (S.W.) . .	22	65	55	Carr, T. J. (S.W.) . .	19	19
65	Becker, W. (Lang.) . .	23	65	67	Everlay Poultry Farm (B.L.) . .	5	7
69	Dibbs, H. (Lang.) . .	22	63				
68	Everlay Poultry Farm (B.L.) . .	24	57				

WHITE LEGHORNS.

Pen No.	Owner.	July.	Total.	Pen No.	Owner.	July.	Total.
132	Short, J. W. . .	25	103	106	Hutton, J. . .	24	78
112	Chapman, S. . .	23	95	129	Manning, H. G. . .	20	78
105	Hutton, J. . .	21	94	101	Turner, R. C. J. . .	22	77
131	Short, J. W. . .	21	91	122	Grant, W. . .	23	77
114	Cole, R. C. . .	23	89	93	Williams, D. W. . .	22	75
74	Dippel, D. H. . .	22	87	123	King, J. E. . .	20	73
78	Howard, R. B. . .	23	86	100	Newton, J. W. . .	21	71
124	King, J. E. . .	23	85	116	Taylor, J. . .	24	71
110	Emoh Pens . .	23	84	103	Fallon, P. J. . .	23	70
111	Chapman, S. . .	20	83	113	Cole, R. C. . .	16	69
73	Dippel, D. H. . .	23	82	75	Wilson, W. . .	20	68
115	Taylor, J. . .	21	81	102	Turner, R. C. J. . .	20	68
121	Grant, W. . .	21	81	108	Adams, P. F. . .	20	67
91	Stilton, G. . .	22	80	118	Goggins, J. . .	27	67

WHITE LEGHORNS—continued.

Pon No.	Owner.	July.	Total.	Pon No.	Owner.	July.	Total.
77	Howard, R. B.	.. 21	66	80	McBean, S. ..	.. 17	50
104	Fallon, P. J.	.. 21	65	92	Stilton, G. ..	.. 20	50
109	Emoh Pens ..	.. 19	65	107	Adams, P. F. ..	.. 16	49
99	Newton, J. W.	.. 19	63	81	Smith, E. R. ..	.. 14	48
88	Warrian, C. G.	.. 24	62	90	Ellis, L. E. ..	.. 19	48
125	Maurer, G. ..	.. 24	62	83	Carinya Poultry Farm	11	46
95	Adams, W. S.	.. 21	61	120	Rogers, G. E. ..	.. 25	45
87	Warrian, C. G.	.. 24	60	126	Maurer, G. ..	.. 23	44
97	Hunt, G. ..	.. 22	60	130	Manning, H. G. ..	.. 24	43
117	Goggins, J. ..	.. 25	60	84	Carinya Poultry Farm	20	41
128	Stilton, E. J.	.. 23	60	79	McBean, S. ..	.. 23	40
86	Rivett, R. R. ..	.. 22	58	119	Rogers, G. E. ..	.. 8	40
96	Adams, W. S.	.. 22	57	94	Williams, D. W. ..	.. 15	38
76	Wilson, W. ..	.. 21	56	89	Ellis, L. E. ..	.. 15	37
85	Rivett, R. R. ..	.. 22	55	98	Hunt, G. ..	.. 18	29
127	Stilton, E. J.	.. 17	54	82	Smith, E. R. ..	.. 3	15

J. GARNER, Government Supervisor.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF JULY, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING JULY, 1924 AND 1923, FOR COMPARISON.

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	July.	No. of Years' Records.	July, 1924.	July, 1923.		July.	No. of Years' Records.	July, 1924.	July, 1923.
<i>North Coast.</i>	In.		In.	In	<i>South Coast—continued:</i>	In.		In.	In.
Atherton	0·94	23	1·62	0·52	Nambour	2·82	28	9·97	4·71
Cairns	1·60	42	2·75	0·39	Nanango	1·77	42	2·87	1·29
Cardwell	1·45	52	0·20	0·57	Rockhampton ...	1·51	37	2·02	0·35
Cooktown	0·98	48	3·37	0·16	Woodford	2·53	37	4·89	2·82
Herberton	0·73	37	1·19	1·01					
Ingham	1·62	32	0·50	0·51	<i>Darling Downs.</i>				
Innisfail	4·70	43	8·89	2·95	Dalby	1·80	54	1·65	0·62
Mossman	1·61	15	1·98	0·05	Emu Vale	1·61	28	2·13	0·96
Townsville	0·59	53	...	0·09	Jimbour	1·67	36	1·34	0·41
<i>Central Coast.</i>					Miles	1·75	39	2·06	0·49
Ayr	0·70	37	0·01	0·06	Stanthorpe	2·07	51	2·75	1·57
Bowen	0·97	53	0·14	0·47	Toowoomba	2·07	52	4·83	0·99
Charters Towers ...	0·66	42	..	0·16	Warwick	1·84	59	3·45	6·97
Mackay	1·75	53	0·47	1·19					
Proserpine	1·43	21	0·72	0·04	<i>Maranoa.</i>				
St. Lawrence	1·32	53	2·08	1·45	Roma	1·50	50	2·92	1·08
<i>South Coast.</i>									
Biggenden	1·35	25	4·58	0·79	<i>State Farms, &c.</i>				
Bundaberg	1·93	41	3·63	0·90	Bungeworgorai ...	1·67	10	3·44	1·13
Brisbane	2·35	73	5·33	2·05	Gatton College ...	1·43	25	2·62	0·61
Childers	1·68	29	6·64	1·00	Gindie	1·09	25	0·33	0·42
Crohamhurst	2·91	30	9·17	4·57	Hermitage	1·81	18	2·85	0·74
Esk	2·60	37	4·96	1·14	Kairi	1·27	10	1·80	0·51
Gayndah	1·52	53	2·42	1·29	Sugar Experiment Station, Mackay	1·59	27	1·55	0·74
Gympie	2·19	54	5·64	2·81	Warren	1·34	10	1·59	0·75
Glasshouse Mts. ...	2·61	16	..	3·54					
Kilkivan	1·71	45	2·63	1·50					
Maryborough	1·98	53	4·69	2·87					

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for July, 1924, and for the same period of 1923, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND, State Meteorologist.

STUDIES ON FERTILITY OF SUGAR-CANE FLOWERS.

SOUTH JOHNSTONE SUGAR EXPERIMENT STATION, 1924.

Mr. W. Cottrell-Dormer, entomologist, reports to the Director of the Bureau of Sugar Experiment Stations (Mr. H. T. Easterby) as follows:—

The following observations were made by Mr. McWalters and myself during the first half of July, 1924:—

As we were almost entirely lacking in literature dealing with the processes of pollination and fertilisation of the cane flower, we deemed it necessary to start at bedrock that we might obtain a thorough grasp of our subject. Thus flowers were taken at different stages, and with the aid of a good microscope observations were made.

When the lodicules at the base of the ovary commence to swell and the glumes and palets open up, the two purplish feathery stigmas droop out and ripen. Shortly afterwards the three unripe anthers are loosened and hang about the stigmas. On first emerging these are of a light yellow colour. Under the influence of light and warmth the anthers gradually assume a purple tinge, similar to that of the stigmas. In normal circumstances a healthy anther will, at this stage, burst open. These two stages are depicted in Figs. (a) and (b). As the slightest breeze is sufficient to cause the anthers to swing about, the pollen contained within is loosened and dusted on the stigmas. The stigmas are covered with a sticky, syrupy secretion, which serves to hold whatever pollen may chance to fall upon them. This fluid or secretion also has high nutritive properties. On coming into contact with the fluid the pollen grain, if ripe, shows a chemotaxical reaction. It is influenced by the fluid and germinates. The pollen grain has two walls—the intine and the extine—the extine is thicker and is pierced by a small pore or micropyle (Fig. (a)). A filament of protoplasm is protruded through the intine and through the micropyle of the extine. This filament, known as the pollen tube, acted upon by chemical stimuli, slowly increases in length (Fig. (d)), and finds its way to the stigma. It then enters the latter, and still increasing in length, eventually reaches the ovary, passing through the style of the stigma. Union then takes place with the female cell of the ovary, and the latter is fertilised.

Field Observations.

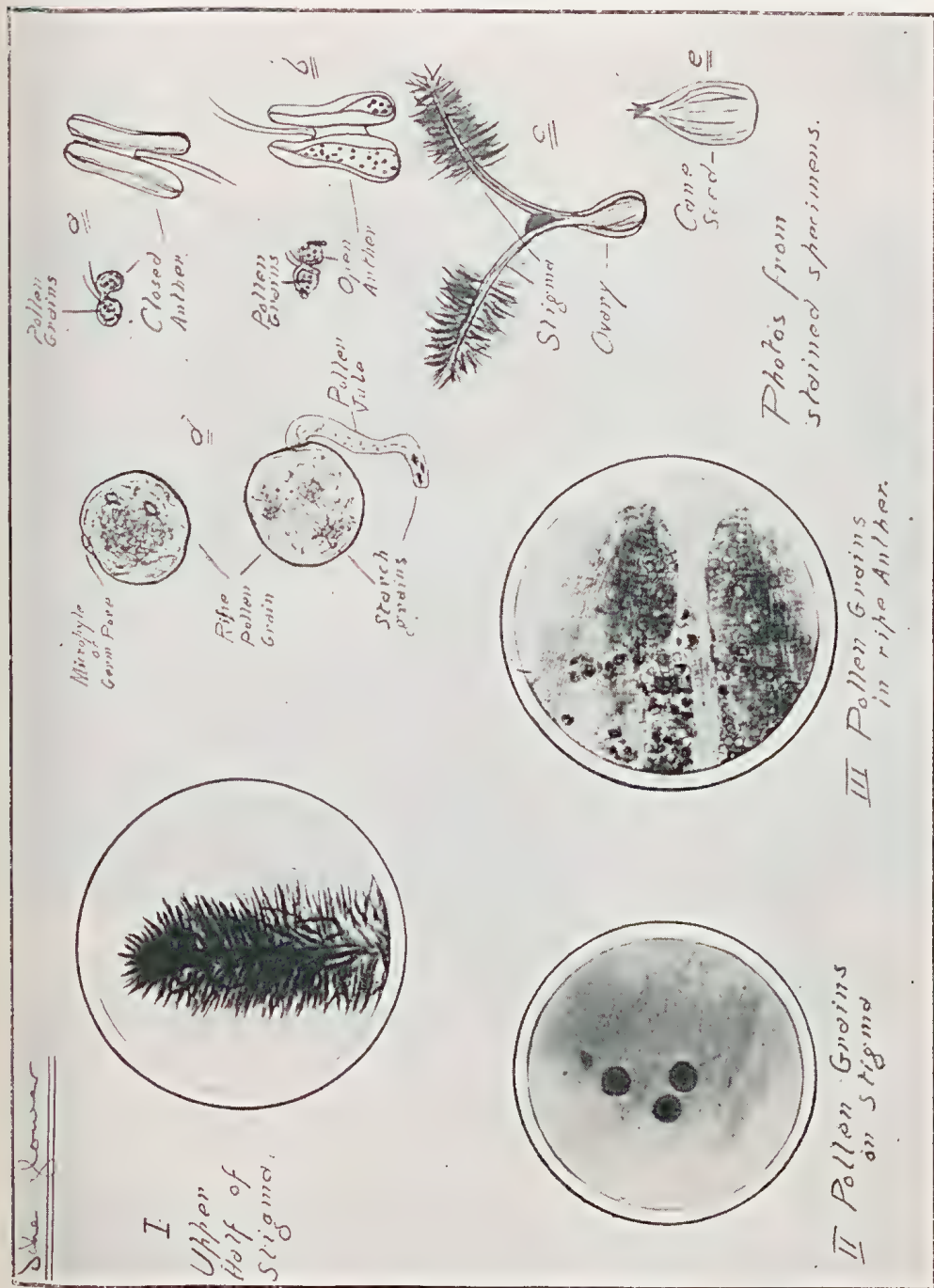
Having obtained this information we made a thorough examination, with pocket lenses, of arrows of various cane varieties. We found that in most of the varieties the anthers, though well exerted, were dying off without ripening and opening. Under these circumstances the flowers would be almost entirely dependent on wind-pollination for fertilisation. If the big majority of surrounding arrows were similarly immature, which was the case, the chances of pollination for each individual flower would be very small. This would account for the very poor percentage of germinations which were being obtained. The weather at the time was constantly showery and the sky overcast. Two varieties out of those examined, D.109 and Q.1092, were the only ones found with any appreciable percentage of open anthers. Badila had exceedingly few, and Goru (24 and 24A) had none at all. During the next couple of days the weather fined up, and we had fairly strong sunshine. Observations were continued, and we found that most of the varieties were favourably influenced by this change. The younger Badila arrows bore mature flowers, though the older ones remained obdurate. Goru showed but very slight improvement, and several arrows might be examined without finding mature anthers.

Cross Pollination.

This observation suggested that cross pollination might be a fairly simple matter if arrows with open anthers were used as males and those with closed anthers as females.

Experiment 1.—We decided to attain this object by occasionally shaking mature male arrows over and to windward of a selected female arrow. As an experiment we decided to use (1) D.109 male x N.G.15 female; (2) Q.1092 male x N.G.15 female; (3) N.G.15 male x N.G.24A female. We selected male arrows with numbers of open anthers and took samples thereof. Female arrows with immature anthers were picked out and conspicuously marked. Samples of the flowers of these were also taken. All these samples were kept well separated in different tubes. Now it was necessary to determine whether the pollen was viable and whether the stigmas were receptive. One method is to dust the pollen on to the stigmas of a *Datura* or of a *Hibiscus*. We tried the latter, but found it very awkward to handle under the microscope. The method we found most practical was to dissect a number of flowers and place the ovaries with stigmas in small damp filter paper cells on glass slides. For single ovaries the usual 3-inch by 1-inch slide was used. A piece of

filter paper cut about the size of the rectangular cover glasses we were using was punched with a small hole in the centre. The paper was placed on the slide and damped. An ovary with stigmas was placed in this and carefully examined with a 2-3-inch objective to see that no wind-borne pollen had yet found its way to the stigmas. Pollen of the desired male was then dusted on by holding an open anther



with forceps and teasing with a needle. Another examination was made with the microscope to see that pollination had been effected. The cover glass was then dropped over the whole and the slide set aside for two hours. When this time had elapsed a further examination was made. If ripe pollen had been used and the stigmas were receptive the pollen grains could be seen to have sent out pollen

tubes. Tests were made in this way with the varieties mentioned above by using several ovaries from different parts of the arrow and anthers in various stages of maturity, but all open. In this class long strips of filter paper were used with several holes, and cover glasses placed on 6-inch by 2-inch slides. The strips were kept moist by a thread of cotton leading to a small dish of water. The anthers used were also subjected to the iodine test for starch which, when present, is a sign of ripeness though not always of viability. Photo. I. shows the upper portion of a mature stigma. Photo. II. and Fig. (d) show mature pollen grains sending out pollen tubes. Figs. (a) and (b) show closed and open anthers with cross sections, all diagrammatic. Photo. III. shows portion of a mature, slightly opened anther, stained and slightly compressed to show contained pollen grains. These are seen to vary in colour from perfectly hyaline to almost entirely black. Iodine has been used in the stain, and this black colour is due to the contained starch, which stains deep blue. The hyaline grains are immature.



PLATE 79.

SECOND STAGE SEEDLINGS, FIFTEEN MONTHS' OLD. NO IRRIGATION. JULY, 1924.

Thus it was decided that the selected parents should hybridise without great difficulty and that the shaking method was quite practicable. Male arrows were therefore shaken against female ones in the order mentioned above for three days, once to twice a day, fresh arrows being used each time. In the case of Goru and Badila, the weather interfered with operations after three dustings. Flowers were examined after dusting, and a few pollen grains could readily be detected.

Development of Seed.

With a view to ascertaining the correctness of our supposition that open anthers meant fertile ovaries, we cut off a fairly young arrow of D.109 which had many open anthers, and stood it in water in the laboratory. Most of the stigmas were found to have been pollinated. Stigmas were taken from time to time, treated, and examined with a 1/6-inch semi-holoscopic objective. At first the pollen tubes were found to be quite short. As fresh stigmas were examined at intervals of two or three hours, longer pollen tubes could be seen, and they were found to have entered the stigmatic hairs. After forty-eight hours most of the tubes had descended the whole length of the hairs and were lost to view. Thus it was seen that fertilisation and development of the ovary must be rather a lengthy process.

Arrows of Goru, whose anthers were dying off without opening, were compared with those of D.109, which had open anthers. On dissecting the flowers it was found that the ovaries of old and young flowers of Goru were small and often shrivelled, whereas in the case of D.109 the ovaries varied greatly in size from small infertile ones to some twice their size, which were evidently fertile and developing into healthy seed. Older arrows of both varieties were examined. Whereas the Goru flowers contained but the very small green immature ovaries, even when both anthers and stigmas were long dead, those of D.109 in many cases contained plump, healthy-looking, light-brown seed. This applied also to other varieties whose anthers had died unopened, only occasionally could a seed be found, which was probably due to wind-pollination. It has been stated that three weeks usually elapses between the first opening of the arrow and the ripening of the seed.



PLATE 80.

SECOND STAGE SEEDLINGS, FIFTEEN MONTHS' OLD. NO
IRRIGATION. JULY, 1924.

Ripening of Fertile Husks in Arrows.

As there are many thousand husks in each single arrow it would be a matter of great difficulty to make an accurate estimate of this figure. However, we carried out several experiments aiming at obtaining a reliable method of testing suitability for planting of selected arrows. An old husk containing a fully developed seed weighs considerably more, proportionately speaking, than an old non-fertile husk. If small bunches of husks be pulled of a mature arrow and rubbed into a ball between the hands, many of the dry husks fall out. It was found on examination that these contained most of the seed—i.e., that those husks which remained between the hands were mostly non-fertile. The husks which fall are for the

greater part freed from hairs and bristles in the rubbing. By simply feeling these fallen husks individually one could distinguish those which contained seed, or by noting the sound when dropped on to a sheet of paper. Buoyancy tests were made in water, alcohol, and ether. All husks floated in water, but in alcohol and in ether a certain percentage invariably sank. With alcohol many of these heavy husks contained seed. In the case of ether most of them proved to be fertile. Thus ether proved to be the best test for fertility of husks on ripe arrows. When seeds are taken out from the palets and glumes of the old flowers they are found almost invariably heavier than water. Blowing was also tried, both by breath and mechanically (with a Buffalo forge), but results were not certain, as often the stem of the flower remains attached after rubbing and offers increased surface, which, in the case of fertile husks, counterbalances the greater momentum.

Thus an indication of the percentage of fertile husks in an arrow and of the possible percentage of germination may be arrived at by rubbing up different parts of the arrow, mixing the husks which fall and testing them in ether.

Germination of Cane Seeds.

In order to check our conclusions the following experiment was initiated:—

Experiment 2.—A seed flat was prepared with good soil and divided with string into six squares, numbered 1 to 6, and planted as follows:—

1. 10 seeds used in water buoyancy test from upper portion of arrow.
2. 7 seeds used in ether buoyancy test from upper portion of arrow.
3. 100 husks rubbed out from spikelets at random from upper portion of arrow.
4. 100 husks plucked out from arrow at random from upper portion of arrow.
5. 100 husks rubbed out from spikelets at random from lower portion of arrow.
6. 100 husks plucked out from arrow at random from lower portion of arrow.

Husks from the arrow had previously been tested in ether which showed a possible germination of 33 per cent. Actually 25 per cent. contained seed. Results of experiment will be given at end of report. Another experiment relative to germination, but irrespective of ether or other tests, will be detailed at end of report. In these and other experiments it was found that germination was strongly influenced by warmth, and that by keeping flats fairly warm—say, 27 deg. C. or 30 deg. C. on the second and third nights—early sprouting was greatly enhanced.

Conclusion.

Results of the above observations may be briefly summarised thus:—

(1) At the commencement of the arrowing season the operator should go into the field and make examinations of a number of arrows. With a little practice it can readily be determined whether anthers are bursting with the naked eye. Those arrows with bursting anthers should be marked conspicuously with a dated label. When ripe they are to be brought in, and 300 or 400 husks rubbed out from representative parts of each arrow. These husks may then be tested for fertility with ether, and the best arrows selected for planting.

(2) Suitable young female arrows should also be marked and pollen dusting carried on from day to day, after making viability tests, with a view to obtaining hybrids with selected male parents. This method of dusting is, of course, somewhat inaccurate and untrustworthy as no emasculation is practised. However, if time were available it would be a simple matter to emasculate and pollinate individual flowers.

The very small percentage of germinations recently obtained was apparently due to the fact that in most of the varieties under cultivation the anthers were dying without maturing. This state was probably brought about by climatic factors, since when the wet cloudy weather changed to sunshine for a couple of days, open anthers were found to a greater or lesser extent on all these varieties.

Insects Attacking Arrows.

A large green Aphis was found to be fairly plentiful on many arrows. It was invariably solitary and unattended by ants or other insects. On one arrow a larva of a Syrphid fly was observed; it was not in the act of devouring an Aphis but it is probably an enemy of the latter. The Aphis usually rests on the stem of a flower or panicle where it inserts its proboscis. Two species of small Fulgorid Leaf Hoppers were frequently met with sucking the sap of the short flower stems. It was often noticed that odd flowers in a panicle were dead and dried up while the remainder still remained vigorous. This may have been due to these sap-sucking insects.

Fungi on Flowers.

Two widely different genera of Fungi were found represented on old flowers, or husks. One of these, the more common, was a *Mucor*, and in warm weather would probably spread rather rapidly in germination flats.

Methods of Procedure in Investigations.

For examination of pollen grains, pollen tubes, stigmas, anthers, &c., the following method was used:—A mixture composed of 50 per cent. lactic acid 200 parts, water 40 parts, potassium iodide 1 part; the two last components were first mixed and saturated with pure iodine, and poured into the lactic acid and well stirred. The

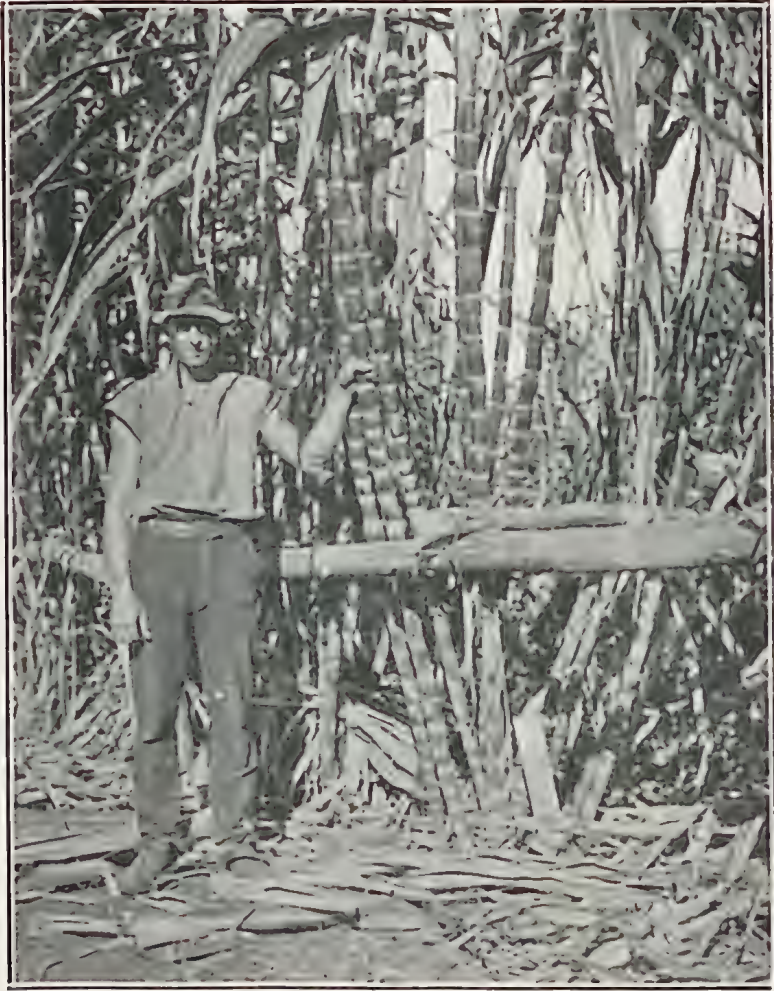


PLATE 81.

SECOND STAGE SEEDLINGS, FIFTEEN MONTHS' OLD. NO IRRIGATION.
JULY, 1924.

organ, or organs, to be examined was dropped into a little of this mixture and the whole brought to the boil and allowed to cool. The lactic acid bleaches the organ and clears it, and acts as a good mounting medium for temporary work, while the iodine stains the extine of the pollen grains yellow and the starch grains blue. This enables one to follow the pollen tubes (whose protoplasm stains yellow), which contain a few starch grains at their extremity into, or about, the transparent stigma. One is also able to determine whether the pollen grain is ripe or otherwise, as it remains perfectly hyaline if unripe. (See Photo. III.) The whole operation may be performed on a slide or cover glass, but it is preferable to use a watch glass, as

otherwise the small amount of fluid used would take on a red tinge from the natural colour of the stigmas and anthers. Whole flowers may be treated in this manner and examined in ground cells. To obtain a good view of the pollen-tube a $\frac{1}{4}$ in. or $\frac{1}{12}$ in. immersion objective is necessary, though they are readily detected with a $\frac{2}{3}$ in.

For photographic work carbol-fuchsin was added to the reagent and filtered. By moderating the heating of the stain and length of immersion very different effects may be obtained. When stained the organ may be washed in dilute alcohol or placed directly in 50 per cent. lactic acid, washed in this, and mounted in it. The stain is best used fresh, and the results are at their best a few hours after staining. Very beautiful and clear effects are obtained, as may be judged by Photo. III.; pollen grains stain a light-blue with deep-blue starch grains, cuticle light-yellow, stigmas deep reddish-brown to violet-red according to length of immersion, nuclei deep violet.



PLATE 82.

THIRD STAGE SEEDLINGS SELECTED FROM PRIMARY SECOND STAGE CANES, PLANTED
FOURTEEN WEEKS, JULY, 1924.

A simple method of separating seeds from husks:—The husk is pressed with the finger nail at its base against the table or other support, and the point of a fine pair of forceps or other instrument pressed on the side and run up to the extremity. If a seed is lodged within the husk it will be thrown out by this procedure. The seed is a small light-brown bulb-shaped object 1.25 mm. to 1.5 mm. in length.

Results of Experiments.

Experiment (2).—Total germinations:—

(1)—2; (2)—0; (3)—18; (4)—11; (5)—1; (6)—0.

These germinations took place over a period of ten days, and do not include some which were "probably eaten by insects—Nitidulid beetles, &c.—unknown to us. It is interesting to note that none of the seeds treated with ether germinated; although ether is said to stimulate germination (perhaps not when used in this manner).

Experiment (3).—Filter paper tests:—

Strips of filter paper (sterilised) were good. Arrows were somewhat on the unripe side, so that germinations were not the best.

Strip.	Variety.	Portion of Arrow.	Number of Husks.	Germinations.
1	Q. 903	Top	100	..
2	Q. 903	Bottom..	100	..
3	N.G. 16 (young arrow)	Top	100	3
4	N.G. 16 (young arrow)	Bottom..	100	..
5	N.G. 16 (older arrow)	Top	100	1
6	N.G. 16 (older arrow)	Bottom..	100	1
7	Q. 1092	Top	100	..
8	Q. 1092	Bottom..	100	..
9	E.K. 28	Top	300	..
10	E.K. 28	Bottom..	100	..
11	D. 109	Top	300	1
12	D. 109	Bottom..	300	1

These poor results may also have been due to the very cold nights which have prevailed of late.

A flat planted by Mr. McWalters six days ago now shows over 400 germinations—variety D.109. Another shows upwards of 100—variety Q.903. The arrows used were first tested with ether, and the above results approximate very closely our estimate. These results also bear out our finding with regard to pollination, fertility, &c. They also explain why it is that some workers in other countries obtain such enormous numbers of germinations. They stick to good pollinating varieties and plant great quantities of their husks.

CAUSES OF LOW TESTS OF CREAM.

F. J. WATSON, Instructor in Dairying.

Variations in cream tests are commonly a source of annoyance to dairymen and to butter factory managers, and frequently complaints are made to factory managers of which the following letter is typical:—

"I cannot understand test dropping like it does. Only last week I got a notice from you that the test was down to 30 per cent., and, without any alteration of the cream screw, the following can was 37 per cent. Since then I have tightened cream screw, with the result that the test is lower than ever. Our herd is composed chiefly of registered Jerseys, which are fed on the same feed every day. Also, they are milked by the same person; and the separator is always turned by the same person. For feed they get one kerosene tin of chaffed cow-cane, or barley with pulped pumpkin, sweet potatoes, and turnips; also cornmeal. If cows will not cream on that—well, I give up. While running on grass our cows averaged 4.87 per cent. by Government test; one went as high as 6.6 per cent. By that you can see they are cream producers."

The writer of this letter, in common with many dairymen, was obviously ignorant of the fact that the percentage of butter-fat in milk has no relation to the percentage of butter-fat in the cream produced from the milk.

Provided that the mechanism of a separator is in good order, the percentage of fat in cream is entirely dependent on the proper adjustment of the devices which regulate the flow of milk into the separator bowl and the outflow of milk and cream therefrom, and the speed at which the separator bowl is driven; which should be as set out by the manufacturer of the separator.

Any of the modern makes of separator may be adjusted so that cream of any percentage up to 45 per cent. can be obtained, whether the milk contains 3.5 per cent. or 5.3 per cent. of butter-fat.

In the case of the letter quoted, the writer investigated the matter. He found the separated milk outlets of the bowl (a Sharples' Tubular) to be partially choked, with the result that cream could not be obtained with more than 30 per cent. of fat; but after a thorough cleansing of the tubes, cream of as high as 50 per cent. fat could be obtained, with only 0.05 per cent. of fat in the separated milk.

Causes of Low Tests.

The causes of low tests are many and the following are some of the most common:—

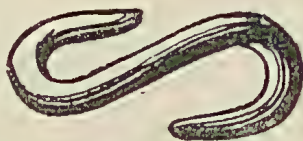
- (1) The separator may be so worn as to allow the bowl to vibrate.
- (2) The separator may be worked at too low a speed or too irregular a speed causing a loss of fat in the separated milk, and a decrease of fat in the cream. Very few persons can turn the handle of a separator at an even speed for any length of time, and it is advisable to check the speed by means of a clock or watch with a second hand.
- (3) The milk may be separated at too low a temperature. Contrary to general opinion, which is influenced by the appearance of the cream as it leaves the separator, cream separated from cold milk contains less fat than that which is separated from warm milk. Milk should be separated as soon after milking as possible, before it has time to cool or the cream to rise.
- (4) The separated milk or water used for flushing the bowl, if allowed to flow into the cream, will lower the butter-fat content. This frequently happens during winter, when the number of "separatings" required to fill a cream can may be four times as many as in the summer time.
- (5) Neglect of proper cleansing of the separator bowl parts is sometimes a cause of low tests, for if the separated milk outlet is clogged in the smallest degree (as it was in the instance mentioned) the milk and cream cannot be delivered from the bowl in their proper proportions.
- (6) In wet weather, especially when succeeding a drought, and with a plentitude of young succulent fodder, there is liable to be a fall in the fat content of cream, owing to an alteration in the specific gravity of the milk. This can easily be remedied by readjustment of the cream screw.
- (7) A frequent cause is due to the device for regulating the flow of milk into the bowl, which is usually a float, being damaged, and so allowing too great a flow of milk. Some people remove the float entirely and regulate the inflow by hand, a practice by which it is impossible to obtain an even percentage of fat in the cream.
- (8) Another cause of variation is due to cream arriving at the butter factory in a condition which makes it impossible, under factory conditions, for the cream tester to obtain a sample which is representative of the whole canful. This happens in winter when the cream is aged and the butter-fat content too high, and in summer when the cream is affected with a gaseous fermentation, or is partially churned.

By imperfect separation there is a much greater loss to the dairymen, and to the dairy industry generally, than is generally imagined; and dairymen should, from time to time, have their separated milk tested, and if the result is found to be abnormally high, say, over 0.01 per cent. fat, the separator should be put into expert hands for repair or readjustment.

A better knowledge of the principles of mechanical separation of cream, and of the mechanism of the separator, would save many a dairyman from being embittered against the factory manager. It would save many a really serviceable separator from being discarded, and save the dairyman from a great deal of annoyance and expense to himself.

CONVENIENT "S" HOOK.

One of the first jobs the amateur blacksmith undertakes is the making of "S" hooks, for which there is a great demand on farms. A very convenient hook is



illustrated, in which a quarter turn is given to one end, so that while one hook lies flat on a level surface the other hook stands up at right angles to the surface. This arrangement prevents the hook from catching in objects on the ground.

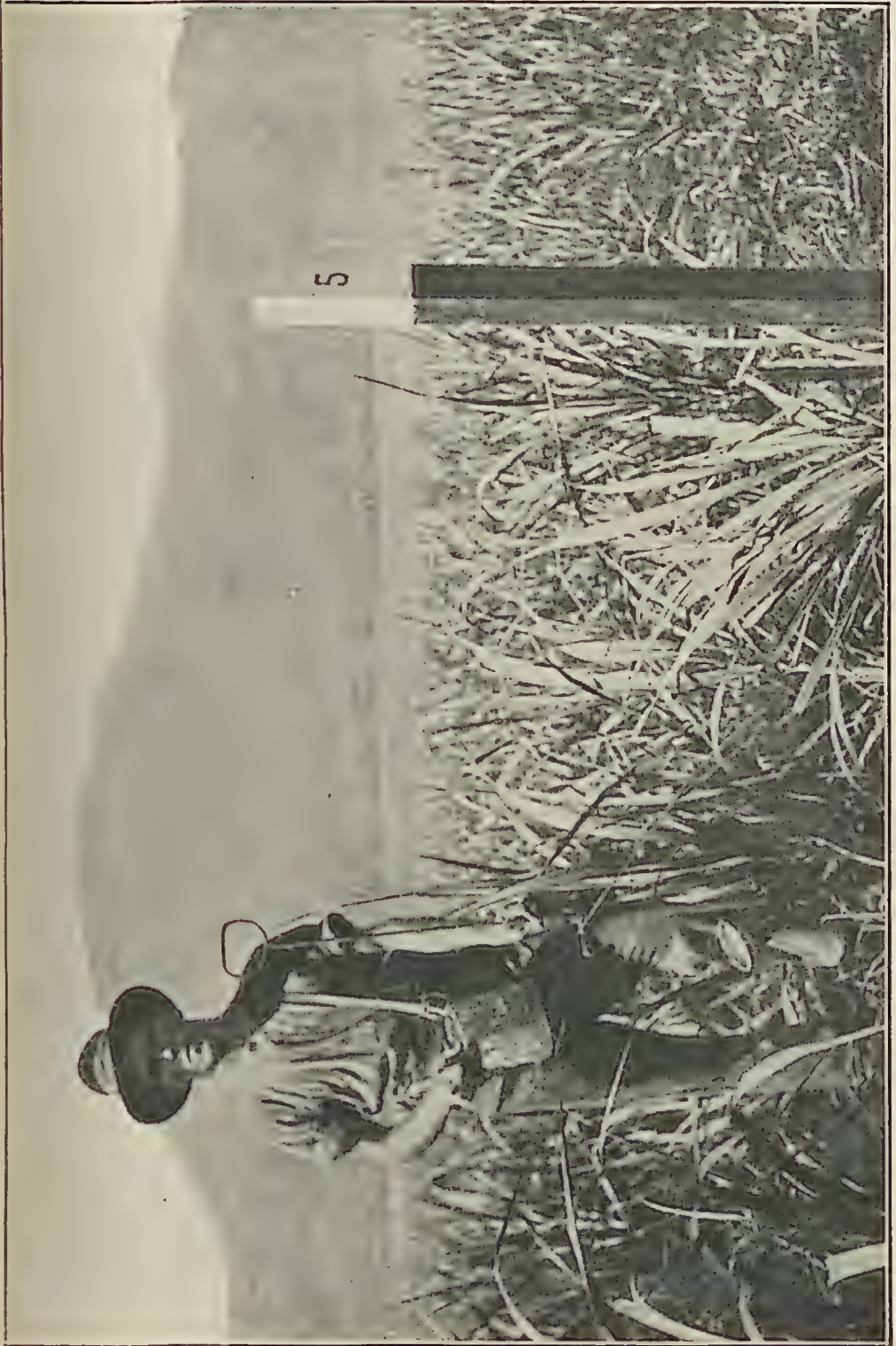


PLATE 83.
One of the "Jarvis Injectors" for applying Para-dichlor. in dry form for fumigating Cane Grubs in a canefield at Meringa, near Cairns.

General Notes.

A Northern Animal and Bird Sanctuary.

"Mungalla," the property of Mr. F. A. Cassady, of Mungalla, Ingham, has been declared to be a Sanctuary in which it shall be unlawful for any person to take or kill any animal or bird.

Cotton Harvesting.

To meet the wishes of a large number of growers and in view of the late planting due to the dry spring, the Minister for Agriculture has decided to permit harvesting of cotton, where necessary, up to the 15th September, after which date all stalks and debris must be immediately destroyed so as to give a close period in which no harbourage for pests will be possible.

Peanut Board.

By Order in Council, peanuts harvested from areas of half an acre and upwards within Queensland, during the season 1923-1924, have been declared to be a commodity under and for the purposes of the Primary Products Pools Acts. A Board has been constituted to deal with such commodity, the Board to consist of four members, one to represent the Council of Agriculture, two elected by growers in the Petty Sessions Districts of Wienholt and Nanaingo, and one elected by growers in other parts of the State. Members will hold office on the Board for twelve months from the date of election. Persons eligible to vote at any referendum or election in connection with the Board shall be persons who have harvested peanuts from areas of half an acre and upwards during the season 1923-24—i.e., between the 1st July, 1923, and the 30th June, 1924.

Wheat Pool Act—Election of Board.

As a result of the extension of the provisions of the Wheat Pool Act, in order that they will apply to wheat of the 1924-25 season, a Regulation has been issued providing for the election of the Board to deal with the crop. Nominations for election as representatives of wheatgrowers on the Board will be received by the Under Secretary, Department of Agriculture and Stock, until noon on the 4th October, 1924. Five representatives are to be elected by growers who have furnished returns of wheat for the 1923-24 season, and also those to whom seed has been supplied by the State Wheat Board for this year's planting, and other *bonâ fide* growers of 1924-25 wheat who may make application for a voting-paper. The members elected will hold office for one year. One person is required to be elected in respect of each of the five districts, and each nomination is to be signed by at least ten growers residing in the district for which the person nominated desires to be elected. No person shall nominate for more than one district, and if more than one nomination is received in respect of one district, a postal ballot will be taken.

Banana Weevil Borer.

A Proclamation has been issued notifying that the removal of any banana plants (excepting the fruit thereof) affected with Banana Weevil Borer, from any nursery, orchard, or other place, is, from the 23rd August, 1924, absolutely prohibited, and that from that date the removal of any banana plant (excepting the fruit thereof) not affected with Banana Weevil Borer, from any nursery, &c., in which the said disease is present, is permitted only on the following conditions:—

"That all ground within a distance of three yards from the place where the plant to be removed is, or has been growing, is and has been kept in a state of thorough cultivation for at least twelve months prior to the digging of the plants.

"Any plant, when dug, is to be at once effectively trimmed by having all roots and trash removed, and the corms pared, and shall then be immediately removed from the place where grown, in such a manner as to prevent its coming in contact with the soil, and then forwarded direct to its destination or stored on a framework raised at least 2 ft. above the ground not less than 200 yards away from the nearest banana plant.

"Any banana plant removed under the conditions prescribed shall, during its removal, have attached to it or to the package or crate wherein it is contained, a certificate to the effect that it complies with the conditions set out in this Proclamation."

Proposed Milk Pool.

Following are the nominations for the Board of Management for the proposed Milk Pool:—James Aitcheson, Riverview; Robert Ellis Clay, Samson Vale; William John Hawkins, Bald Hills; Archibald William Johnston, Thagoona; William Richer Moon, Brookfield; Frederick Augustus Tulloch, Veresdale; Joseph Patrick Walsh, Rosewood; and L. H. Paten, Calvert.

Registration of Cotton Growers.

Regulations have been issued under the Cotton Industry Act which provide for the registration of all growers of cotton. A form of application as a cotton-grower is being prepared, and copies of this will be sent to all cotton-growers, who are expected to complete the form and return it to the Department of Agriculture and Stock before the 30th of November next. It will probably be some weeks before a supply of application forms will be available for distribution.

“Crown Gall” or “Hairy Root.”

The disease affecting trees and plants and known as “Crown Gall” or “Hairy Root” has been proclaimed to be a disease within the meaning of the Diseases in Plants Act, and the removal of any fruit-tree or plant affected with this disease, from any nursery, orchard, or garden in Queensland to any other place in Queensland is prohibited. The introduction into Queensland of any fruit-tree or plant so affected, or grown in any place where this disease is or is suspected to be present, is also prohibited.

Wheat Pool Referendum.

The Minister for Agriculture (Hon. W. N. Gillies) announces that it has been decided to hold a referendum as to whether the Wheat Pool should be continued after the completion of the coming harvest. Accordingly, referendum papers will be sent out to every wheatgrower on the 18th September, asking him whether he is in favour of a continuation of the Wheat Pool and, if so, whether for three, two, or one years. The referendum papers will be returnable to the Under Secretary, Department of Agriculture and Stock, Brisbane, by the 11th October.

Staff Changes and Appointments.

The appointment of Mr. Chas. Cooke, of Upper Pilton, Clifton, as an Acting Inspector of Stock, has been cancelled.

Constable H. Brady, of Cambooya, has been appointed to the position of Inspector of Slaughter-houses.

Constable L. A. Cooke, of Wondai, has been appointed an Inspector of Slaughter-houses.

Mr. T. D. Cullen has been appointed Cane Tester at Inkerman Mill, *vice* Mr. H. B. Staples, deceased.

Mr. E. F. Duffy, formerly Inspector, Diseases in Plants Act, has been appointed Assistant Instructor in Fruit Culture, Department of Agriculture and Stock.

Mr. Mark Harrison, of Toowoomba, has been appointed Chairman of the State Wheat Board in succession to Mr. F. J. Morgan who has resumed duty with his bank as Brisbane manager. Mr. Harrison will hold office from the 1st August, 1924, to the 1st December, 1925, inclusive.

Constables J. A. Holley and N. H. E. Lawley, of Mungallala and Gilbert River respectively, have been appointed Inspectors of Slaughter-houses.

Mr. C. G. Holloway, of Glass House Mountains, has been appointed an Honorary Inspector under the Diseases in Plants Act.

Mr. Chas. Golden, The Canal, Yeulba, has been appointed an Honorary Acting Inspector of Stock.

Mr. J. P. C. Toft, Clerk, Lands Office, Bundaberg, has been seconded for duty to the State Advances Corporation as Acting Inspector, Advances to Settlers Branch, for a period of four months.

Mr. Frank H. Taylor, of Collaroy, New South Wales, has been appointed Assistant Entomologist, Sugar Experiment Stations, Department of Agriculture and Stock.

Weeping of Frozen Beef.

The Australian National Research Council, in conjunction with the Institute of Science and Industry, the Victorian Agricultural Department, and the Melbourne University, has commenced work in connection with the "weeping" of frozen beef. Investigations in England indicated that the "weeping" occurred because constituents of the carcass froze at different temperatures, which produced a separation of those constituents. Experiments with small portions of meat which were frozen rapidly gave promise of success, and it is intended to follow up these experiments on a commercial scale.

Bananas in Western Queensland.

A fruit and vegetable grower at Wyandra in South-Western Queensland reports excellent returns from 800 banana plants of the variety known as the "American Stone." The plants were grown in rows 3 ft. 6 in. apart with 18 in. between the plants in the row. The ground was well worked and dressed with sheep manure. The returns of fruit actually sold were 2 tons 17 cwt. 3 qr. which, as will be noted from the space occupied by the plants, would give at the rate of very nearly 29 tons of fruit to the acre. It would be interesting to know if any Coastal grower has ever received a better result than this.

"Banana Rust," "Banana Scab," or "Banana Thrips."

An additional Regulation under the Diseases in Plants Act has been approved, which provides that the occupier or owner of any land, orchard, or place where bananas affected with the disease known as "Banana Rust," "Banana Scab," or "Banana Thrips" are growing shall dust every young bunch produced by such banana plants within three days after the bunch has made its appearance, with a mixture consisting of one part of finely ground pyrethrum roseum powder and two parts of finely sifted dry wood ash, or such other mixture as an inspector may direct. The removal of any banana plant, excepting only the fruit of same, from any nursery, orchard, or garden in which the disease is known to exist is prohibited, as from 2nd August, 1924.

A Mosquito Eating Fish.

A valuable discovery has been made which it is hoped will go a long way towards exterminating the mosquito pest. It is a natural enemy, a freshwater minnow known as the Top Minnow. In Hawaii it has been used with good effect for years. About twelve years ago the Fiji Superintendent of Agriculture introduced the tiny fish into Fiji for the purpose of minimising the mosquito pest. They were placed in some pools at the experimental farm and then apparently forgotten. They increased at a wonderful rate, and later were found to exist in millions. They do not like running water, preferring stagnant pools, creeks, water-holes, and such places. There they breed and feed upon the larvæ of the mosquito. They will probably be distributed throughout the various islands, including the Solomons and New Hebrides, where by their means the fevers and malaria so prevalent should be reduced. The lively little minnow was first imported into Hawaii from the West Indies, where its activities are valued.

Eucalyptus for the African Veldt.

Many years ago South Africans came to Australia and took back with them seeds of the wattle tree that yields a valuable bark so much sought by tanners. Within a few years South Africa planted out many thousands of acres of country with wattle. With cheap black labour she was able in time to supply the best part of the world's needs of wattle bark for tanning purposes, and to-day the Union has practically a monopoly of this industry.

A significant note is sounded in a report from the New England district of New South Wales, which is to the effect that Mr. C. C. Robertson, of the South African Forestry Department, who came to Australia to acquire a knowledge of Australian hardwoods, has spent ten days being shown around the northern forestry district. The report states that he was greatly impressed with the Glen Elgin forests and the work of re-afforestation now being carried out in the State forest on the Styx River, below Armidale, and elsewhere. At Inverell he is said to have taken special note of stringy bark and blackbutts. It is understood that the South African visitor is inquiring into the possibilities of planting large tracts of the high veldt in Africa with Australian eucalypts. It was noticed that he took particular interest in peppermints, from which eucalyptus oil is largely extracted.

A 5,000-guinea Ram.

Wanganella Station has established what is said to be the world's record by obtaining 5,000 guineas for a merino stud ram, aged five years, the sire of the ram for which 3,050 guineas was obtained at the recent Sydney sales. The record price was paid by Mr. Roy McCaughey, of Coonong. The ram was taken by car from Wanganella to Coonong on 5th August.

Standardisation.

Owing to the active operations of the Australian Commonwealth Engineering Standards Association, standardisation in industry is being carried out with success in Australia. The progress of the association will, however, be more rapid when the whole-hearted support of manufacturers and the public is given to the movement.

There are many misconceptions of the meaning of standardisation in industry. Much has been said and written about the dangers of over-standardisation. Too many people believe that, having once standardised on some method or equipment, they have definitely standardised for all time to come, and that later, when something newer and better makes its appearance, it is impossible to change. Nothing is further from the truth than the above, provided the work of the Standards Association is carried out on the definite approved lines which have been formed by the knowledge obtained from countries which have had Standards Associations in existence for some time. The principal of these are:—Great Britain, America, and Germany. Standardisation in Germany has, perhaps, reached a higher state of efficiency than any other country in the world, the standardisation of industrial productions having been one of the important factors in enabling Germany to maintain its industrial machines intact in face of the multitudinous obstacles now confronting that country. The following interesting example, obtained from a recent bulletin of the American Engineering Standards Committee, of the efficiency of national standardisation as it has been developed in Germany is, in itself, sufficient proof of the value of standardisation. A rush order had been placed with German manufacturers for the delivery of 200 locomotives to Russia. The production of different parts was allotted to seventeen various manufacturers, to be produced strictly upon the plan of interchangeable parts, no one manufacturer making a complete locomotive. The inspectors made a striking test of the feasibility and accuracy of the plan by ordering a complete engine to be assembled, using parts chosen at random from those furnished by the seventeen manufacturers. It proved to be ready for service immediately after assembly without the necessity of any taking down or adjustment of the components. Standardisation in engineering has now become a recognised profession in Germany, and an interesting development of the last few years is the appearance of consulting engineering firms specialising in standardisation work. There are now five such firms in that country.

Wheat Crop Prospects.

The recent rains have practically assured the success of the main wheat crop on the Downs and in the Maranoa. Generally the wheat on the Downs is not quite as forward as is usual at this time of the year. A combination of circumstances seems to have brought this about: The present large maize crop following last year's lean wheat season; light winter rains; the heavy frost on 5th August, which, on account of the mild season, did a good deal of damage; and the custom, which is gradually growing up, of extending the planting season well into August beyond the safe normal period for the development of the wheat plant.

In the Maranoa, as observed by the Director of Agriculture (Mr. H. C. Quodling) in the course of a recent tour through the wheat areas, the rain came in the nick of time. Some of the crops in this district, similarly to those in other wheat-growing regions, had suffered in low-lying places from the early August frost, but has since made an excellent recovery.

At the Roma State Farm, where many very valuable wheats have been produced, a proportion of the crops, particularly a few specially early kinds, were well out in ear and showing well-filled grain, which should be ripe in the first week of next month. From a wheat-breeding standpoint the recent heavy and somewhat unusual August rains will admit of valuable data and special observations being made regarding the behaviour of a number of new wheats, particularly in respect to rust-resistance. This quality is of more than ordinary significance in evolving varieties to meet the rather exacting conditions encountered at times in Queensland. Rust-labile wheats must obviously be eliminated, otherwise the wheat-growers' risk becomes too great.

The maize crop on the Downs was certainly one of the best in the history of farming in this section of the State. Many crops yielded 60 bushels of good-quality grain to the acre. Mr. Quodling witnessed a trial of the Eclipse Maize Reaper Thresher, invented and patented by Mr. George Iland, of Toowoomba, and

manufactured in that progressive town. The machine worked perfectly in a heavy yielding crop, and in his opinion this modern invention goes a long way towards reducing the cost of production of maize to a minimum. Tests recently carried out confirm this, as after taking all overhead charges into account the actual cost of harvesting worked out at 2½d. per bushel. Another factor of importance to the farmer (and not allowed for in this harvesting estimate) was the cutting up of the maize stalks by the machine into short lengths while it was at work, thus admitting of the ploughing up of the land simultaneously with the harvesting of the maize crop. As a matter of fact, a field of well-established wheat was observed which had been put as a following crop after a light preparation of the soil.

Council of Agriculture—Standing Committees.

Standing Committees of the Council of Agriculture have been formed as under:—

Administrative:—Messrs. E. Graham, T. C. Hayes, F. M. Ruskin, W. A. Fielding, and G. E. McDonald.

Dairy:—Messrs. G. Burton (chairman), J. McRobert, J. Harcastle, R. J. Webster, J. T. Tatnell, C. Bateman, and R. Graham.

Fruit:—Messrs. F. M. Ruskin (chairman), T. McEwan, J. S. Mehan, C. Bateman, and W. A. Fielding.

General Agriculture:—Messrs. T. C. Hayes (chairman), H. C. Quodling, E. A. Thomas, T. Brewer, and L. Dascombe.

Sugar:—Messrs. H. T. Easterby (chairman), W. B. Biggs, W. A. Fielding, J. M. Mulherin, and B. Courtice.

Cotton:—Messrs. G. E. McDonald (chairman), R. J. Webster, J. McRobert, J. Harcastle, and T. C. Hayes.

Answer to Correspondents.

Sawdust as a Material for Producing Smoke Clouds.

E.G.C. (Severnlea)—

The Agricultural Chemist, Mr. J. C. Brünnich, advises that sawdust would be quite unsuitable by itself for producing smoke. It would have to be mixed with green wood, leaves, and possibly tar or asphalt to make a dense smoke. In experiments made last year on a cotton crop at Whinstanes for the purpose of testing the efficacy of a smoke screen in combating insect infestation coal tar, a gasworks by-product, was used and dense smoke clouds were produced.

The Care of Goats.

W. D. (Yalamuna)—

The inflammation or enteritis disclosed by the post-mortems of the kids is apparently due to unsuitable feeding. Probably there are other contributory causes of the mortality. Goats require shelter, particularly at night. The shelter should be built off the ground. All that is required is a rough platform about 3 ft. high floored with palings or slats spaced about half an inch apart to allow of droppings falling through to the ground. The platform should be roofed and walled, any rough bush material which would readily suggest itself to you would do. A milking bail should be placed in a corner of the shelter. It is not advisable to secure a goat by the horns when milking her. A bench about 2 ft. high and 1 ft. wide should be built at the entrance of the shelter, and when the kids are born they should be placed in the shed. When the nanny leaves the shed the kids in attempting to follow her will run under the bench, and, consequently, remain behind in the shed. When the kids are old enough to follow their mother they will be able to jump upon the bench at the entrance of the shelter and run with their dam. If the kids can jump upon the bench they are strong enough to follow their dam in the paddock. The nanny should not be milked for some time after kidding—say a fortnight—as the kids require all her milk, especially if she is not hand fed. The sickness among the kids may be due to germ infection. Building a camp for them off the ground would, in that case, give you a better chance of rearing them. The buck should also be a vigorous animal, and should not be allowed to run with too many does. Twenty does to one buck is considered a fair proportion, especially if the buck has to fend for himself.

Farm and Garden Notes for October.

FIELD.—With the advent of warmer weather and the consequent increase in the soil temperature, weeds will make great headway if not checked; therefore our advice for last month holds good with even greater force for the coming month. Earth up any crops which may require it, and keep the soil loose among them. Sow maize, cowpeas, sorghums, millet, panicums, pumpkins, melons, cucumbers, marrows. Plant sweet potatoes, yams, peanuts, arrowroot, tumeric, chicory and ginger. Coffee plants may be planted out. There are voluminous articles in previous journals giving full instructions how to manage coffee plants, from preparing the ground to harvesting the crop, to which our readers are referred.

KITCHEN GARDEN.—Our notes for this month will not vary much from those for September. Sowings may be made of most vegetables. We would not, however, advise the sowing of cauliflowers, as the hot season fast approaching will have a bad effect on their flowering. French beans, including butter beans, may be sown in all parts of the State. Lima and Madagascar beans should also be sown. Sow the dwarf Lima beans in rows 3 ft. apart with 18 in. between the plants. The kitchen garden should be deeply dug, and the soil reduced to a fine tilth. Give the plants plenty of room, both in sowing and transplanting, otherwise the plants will be drawn and worthless. Thin out melon and cucumber plants. Spraying for fungoid diseases should be attended to, particularly all members of the *Cucurbitaceæ* and *Solanum* families, of which melons and tomatoes are representative examples. Give plenty of water and mulch tomatoes planted out last month. Asparagus beds will require plentiful watering and a good top-dressing of short manure. See our instructions in "Market Gardening," obtainable on application to the Under Secretary, Department of Agriculture and Stock. Rosella seeds may be sown this month. No farm should be without rosellas. They are easily grown, they bear heavily, they make an excellent preserve, and are infinitely preferable to the mulberry for puddings. The bark supplies a splendid tough fibre for tying up plants. The fruit also makes a delicious wine.

FLOWER GARDEN.—The flower garden will now be showing the result of the care bestowed upon it during the past two months. The principal work to be done this month is the raking and stirring of the beds, staking, shading, and watering. Annuals may be sown as directed for last month. Plant tuberose, crinum, ismene, amaryllis, paneratum, hermocallis, hippeastrum, dahlias, &c. Water seedlings well after planting, and shade for a few days. Roses should now be in full bloom. Keep free from aphids, and cut off all spent flowers. Get the lawn-mower out and keep the grass down. Hoe the borders well, and trim the grass edges.

Orchard Notes for October.

THE COASTAL DISTRICTS.

October is frequently a dry month over the greater part of Queensland, consequently the advice that has been given in the notes for August and September regarding the necessity of thorough cultivation to retain moisture is again emphasised, as, unless there is an adequate supply of moisture in the soil to meet the trees' requirements, the coming season's crop will be jeopardised, as the young fruit will fail to set.

Thorough cultivation of all orchards, vineyards, and plantations is therefore imperative if the weather is dry, as the soil must be kept in a state of perfect tilth, and no weeds of any kind must be allowed to grow, as they only act as pumps

to draw out the moisture from the soil that is required by the trees or fruit-yielding plants. Should the trees show the slightest sign of the want of moisture, they should be given a thorough irrigation if there is any available means of doing so, as it is unwise to allow any fruit trees to suffer for want of water if there is a possibility of their being supplied with same. Intermittent growth, resulting from the tree or plant being well supplied with moisture at one time and starved at another, results in serious damage, as the vitality is lessened and the tree or plant is not so well able to ward off disease. A strong, healthy, vigorous tree is frequently able to resist disease, whereas when it has become debilitated through neglect, lack of moisture or plant food, it becomes an easy prey to many pests. If an irrigation is given, see that it is a good one and that the ground is soaked; a mere surface watering is often more or less injurious, as it is apt to encourage a false growth which will not last, and also to bring the feeding roots to the surface, where they are not required, as they only die out with a dry spell and are in the way of cultivation. Irrigation should always be followed by cultivation, so as to prevent surface evaporation and thus retain the moisture in the soil.

All newly planted trees should be carefully attended to, and if they show the slightest sign of scale insects or other pests they should receive attention at once. All growth not necessary to form the future tree should be removed, such as any growths on the main stem or main branches that are not required, as if this is done now it will not only save work later on, but will tend to throw the whole strength of the tree into the production of those limbs that will form the permanent framework of the tree. In older trees all water sprouts or other similar unnecessary growths should be removed.

Keep a good lookout for scales hatching out, and treat them before they have become firmly established and are coated with their protective covering as they are very easily killed in their early stages, and consequently much weaker sprays can be used. The best remedies to use for young scales hatching out are those that kill the insects by coming in contact with them, such as miscible oils, which can be applied at a strength of 1 part of oil in 40 parts of spraying material and will do more good than a winter spray of double the strength. In the use of miscible oils or kerosene emulsion, always follow the directions given for the use of these spraying materials, and never apply them to evergreen trees when they are showing signs of distress resulting from a lack of moisture in the soil, as they are then likely to injure the tree, whereas if the tree is in vigorous growth they will do no harm whatever.

All leaf-eating insects should be kept in check by the use of an arsenate of lead spray, taking care to apply it as soon as the damage appears, and not to wait till the crop is ruined. Crops, such as all kinds of cucurbitaceous plants, tomatoes, and potatoes are often seriously injured by these insects, and the loss occasioned thereby can be prevented by spraying in time. In the case of tomatoes and potatoes, a combined spray of Bordeaux or Burgundy mixture and arsenate of lead should be used, as it will serve the dual purpose of destroying leaf-eating insects and of protecting the plants from the attack of Irish blight.

Grape vines require careful attention, and, if not already sprayed with Bordeaux mixture, no time should be lost in applying this material, as the only reliable method of checking such diseases as anthracnose or black spot and downy mildew is to protect the wood and foliage from the attack of these diseases by providing a spray covering that will destroy any spores that may come in contact with them. The planting of bananas and pineapples can be continued during this month. See that the land is properly prepared and that good healthy suckers only are used. Keep the plantations well worked, and allow no weed growth. Keep a very careful lookout for fruit flies; destroy every mature insect you can, and gather and destroy every fallen fruit. If this is done systematically by all growers early in the season, the subsequent crops of flies will be very materially decreased. See that all fruit sent to market during the month is carefully handled, properly graded, and well packed—not topped, but that the sample right through the case or lot is the same as that of the exposed surface.

GRANITE BELT, SOUTHERN AND CENTRAL TABLELANDS

Much of the matter contained under the heading of "The Coast Districts" applies equally to these parts of the State, as on the spring treatment that the orchard and vineyard receives the succeeding crop of fruit is very largely dependent. All orchards and vineyards must be kept in a state of perfect tillth, and no weed growth of any kind should be allowed. In the Western districts, irrigation should be given whenever necessary, but growers should not depend on irrigation alone, but should combine it with the thorough cultivation of the land so as to form and keep a fine soil mulch that will prevent surface evaporation.

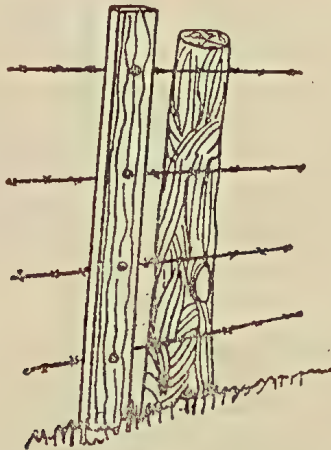
All newly planted trees should be carefully looked after and only permitted to grow the branches required to form the future tree. All others should be removed as soon as they make their appearance. If there is any sign of woolly aphis, peach aphis, or scale insects, or of any fungus diseases on the young trees, these diseases should be dealt with at once by the use of such remedies as black leaf forty, Bordeaux mixture, or a weak oil emulsion. In older trees, similar pests should be systematically fought, as if kept in check at the beginning of the season the crop of fruit will not suffer to any appreciable extent. Where brown rot has been present in previous years, two or more sprayings with Bordeaux mixture can be tried, as they will tend to check other fungus growths, but at the same time the sodium or potassium sulphide sprays are more effectual for this particular disease and should be used in preference when the fruit is nearly full grown. All pear, apple, and quince trees should be sprayed with arsenate of lead—first when the blossom is falling, and at intervals of about three weeks. Spraying for codlin moth is compulsory in the fruit district of Stanthorpe, and wherever pomaceous fruits are grown it must be attended to if this insect is to be kept in check.

In the warmer parts a careful check should be kept for any appearance of the fruit fly, and, should it be found, every effort should be made to trap the mature insect and to gather and destroy any affected fruit. If this is done, there is a good chance of saving the earlier ripening summer fruits, if not the bulk of the crop. Tomato and potato crops will require spraying with Bordeaux mixture, as also will grape vines. Keep a very strict watch on all grape vines, and, if they have not already been treated, don't delay a day in spraying if any sign of an oil spot, the first indication of downy mildew, appears on the top surface of the leaf. Spraying with Bordeaux mixture at once, and following the first spraying up with subsequent sprayings, if necessary, will save the crop, but if this is not done and the season is favourable for the development of the particular fungus causing this disease, growers can rest assured that their grape crop won't take long to harvest.

Where new vineyards have been planted, spraying is also very necessary, as if this is not done the young leaves and growth are apt to be so badly affected that the plant dies.

SPACING BARBED WIRE.

If a spacing stick is used when erecting a barbed-wire fence a much neater appearing and more satisfactory job will result. Besides, the spacing stick will be a great time-saver. A piece of 4 in. x 1 in., about 5 ft. long is a satisfactory size. Drive an eight penny nail through the board as far from one end as you wish the



bottom wire to be from the ground. Similarly drive nails for all the other wires. In using, the stick is set upright beside a post; the wires are slipped on to the nails—the points, not the heads—and the wires are held in place while the stapling is being done. By pressing a knee or thigh against the board the wire is held snugly against the post.—“Country Gentleman.”

ASTRONOMICAL DATA FOR QUEENSLAND.

TIMES COMPUTED BY D. EGLINTON, F.R.A.S.

TIMES OF SUNRISE AND SUNSET.

AT WARWICK.

1924.	OCTOBER.		NOVEMBER.		DECEMBER.	
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.
1	5:33	5:50	5:3	6:9	4:51	6:32
2	5:32	5:51	5:2	6:10	4:51	6:33
3	5:31	5:51	5:1	6:11	4:50	6:34
4	5:30	5:52	5:0	6:12	4:50	6:35
5	5:29	5:52	5:0	6:13	4:50	6:36
6	5:28	5:53	4:59	6:13	4:50	6:36
7	5:27	5:53	4:59	6:14	4:50	6:37
8	5:25	5:54	4:58	6:14	4:51	6:37
9	5:24	5:54	4:57	6:15	4:51	6:38
10	5:23	5:55	4:57	6:16	4:51	6:39
11	5:22	5:55	4:56	6:17	4:52	6:39
12	5:21	5:56	4:56	6:18	4:52	6:40
13	5:20	5:56	4:55	6:18	4:52	6:40
14	5:19	5:57	4:55	6:19	4:53	6:41
15	5:17	5:58	4:54	6:20	4:53	6:41
16	5:16	5:58	4:54	6:20	4:53	6:42
17	5:15	5:59	4:53	6:21	4:54	6:42
18	5:14	6:0	4:53	6:22	4:54	6:43
19	5:13	6:1	4:52	6:23	4:55	6:43
20	5:12	6:1	4:52	6:24	4:55	6:44
21	5:11	6:2	4:52	6:25	4:56	6:45
22	5:10	6:3	4:52	6:25	4:56	6:45
23	5:9	6:3	4:52	6:25	4:57	6:46
24	5:9	6:4	4:51	6:27	4:57	6:46
25	5:8	6:4	4:51	6:28	4:58	6:47
26	5:7	6:5	4:51	6:28	4:58	6:47
27	5:7	6:5	4:51	6:29	4:59	6:48
28	5:6	6:6	4:51	6:30	5:0	6:48
29	5:6	6:7	4:51	6:31	5:0	6:49
30	5:5	6:7	4:51	6:31	5:1	6:49
31	5:4	6:8	...	...	5:1	6:49

Phases of the Moon, Occultations, &c.

The times stated are for Queensland, New South Wales, Victoria, and Tasmania.

6 Oct. (First Quarter 12 30 a.m.

13 " O Full Moon 6 21 a.m.

21 " D Last Quarter 8 54 a.m.

28 " N New Moon 4 57 p.m.

Perigee, 3rd and 30th October { 3 6 p.m.
 { 12 12 a.m.

Apogee, 18th October .. 6 18 p.m.

On the 10th October, at 8:17 p.m., Uranus will be in conjunction with the moon about three times the moon's diameter below it. This should be observable in binoculars.

On 23rd October, at about 10 p.m., Regulus will be occulted by the moon at Thursday Island, but not at Cooktown or Cairns, where Regulus will appear just above the edge of the moon; further south the distance between Regulus and the moon will appear greater.

On the 26th October, at 1:0 p.m., Mercury will be in superior conjunction with the sun—that is, on the far side of its orbit beyond the sun, where it will be quite invisible. Venus will be a morning star, and Saturn, Jupiter, and Mars will be visible in the evenings during this month.

4 Nov. (First Quarter 8 18 a.m.

11 " O Full Moon 10 0 p.m.

20 " D Last Quarter 3 38 a.m.

27 " N New Moon 3 15 a.m.

Apogee, 15th November, 11:0 a.m.

Perigee, 27th November, 10:36 p.m.

Venus, still the most brilliant morning star, will be about five degrees west of Spica (the principal star of Vergo) on the 15th; Mars on that date will be apparently amongst the smaller stars of Aquarius, setting about half-past 1 in the morning. Jupiter will be apparently amongst the stars of Scorpio about 15 degrees to the north-east of Antares, Saturn will be visible only in the east, rising about an hour before the sun.

3 Dec. (First Quarter 7 10 p.m.

11 " O Full Moon 5 3 p.m.

19 " D Last Quarter 8 11 p.m.

26 " N New Moon 1 45 p.m.

Apogee, 12th December, 6:36 p.m.

Perigee, 26th December, 11:12 a.m.

Mercury will be at its greatest elongation east of the sun on the 10th, and will rise and set one hour and twenty-four minutes after the sun on the 15th, apparently amongst the stars of Sagittarius. Venus will still be the brilliant morning star, rising about 2 a.m. on the 15th, apparently among the stars of Libra; Mars, having apparently reached the constellation Pisces, will set soon after midnight on the 15th. Jupiter will not be so well situated for observation, and will be lost in the sun's rays towards the end of the month. Saturn, as a morning star, will rise about half an hour before Venus in the middle of this month.

For places west of Warwick and nearly in the same latitude, 28 degrees 12 minutes S., add 4 minutes for each degree of longitude. For example, at Inglewood, add 4 minutes to the times given above for Warwick; at Goondiwindi, add 8 minutes; at St. George, 14 minutes; at Cunnamulla, 25 minutes; at Thargomindah, 33 minutes; and at Oontoo, 43 minutes.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night; when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

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PART 4.

Event and Comment.

The Current Issue.

This month Mr. Edmund Jarvis presents additional data on the possibilities of hydro-cyanic gas as a fumigant for use in checking the cane-grub pest. Other activities of the officers of the Bureau of Sugar Experiment Stations are described interestingly. Mr. C. T. White discusses the possibilities of camphor cultivation in Queensland; while Mr. Shelton has chosen for this month's contribution some useful notes on the British Large Black pig. In the course of a short review of seasonal wheat crop prospects, Mr. Quodling strikes an optimistic note. A valuable description of Queensland trees is continued by Mr. White and Mr. Francis, while among the special features of this issue is a paper describing a universal indexing system for wood, which was read by Mr. Swain, Director of Forests, before the recent Science Congress at Adelaide. A plea for the preservation of our native birds is put forth by Mr. Kinghorn, a well-known ornithologist, in the course of a reprinted article. Maize growers will be interested especially in Mr. C. McKeon's notes on seed maize improvement, which are enhanced by some remarkably fine plates. Regular features cover the same broad field, and, as usual, the photographer's art in relation to rural subjects is well represented.

Standardised Wheats.

The Field Branch of the Department of Agriculture and Stock has brought to maturity a scheme for the standardisation of varieties of wheat grown in Queensland. The project covers the co-ordination of the departmental wheat-breeding and wheat-testing work and its linking with the activities of the State Wheat Board. The scientific and technical work necessary to give effect to the scheme will be carried out by the Department as at present, and, when seed of improved varieties recommended by the Department is available from time to time in sufficient quantities, it has been planned that the Board shall take it over by purchase, at a price agreed upon mutually, and shall arrange for sowing the respective varieties in localities and

on picked areas recommended as suitable for the purpose of propagation. The Board, in sequence, is to secure seed from these sources and rail it to its central depot for cleaning, fumigation, grading, and storing for ultimate despatch to localities decided upon as the most suitable for the commercial propagation of specified wheat types. For the purpose of working the scheme successfully, and of the production of standard types of grain, the State wheat areas are to be classified as districts or zones. Local effort will be concentrated accordingly on the growing of suitable types and varieties within each zone. In this way it will be possible to fulfil special milling or export requirements. It is also planned to classify varieties now in cultivation with a view to discarding those that are undesirable or unsuitable for Queensland conditions, or those that are soft, starchy, and of poor milling and keeping qualities. The Board will see that all wheats coming within the category described are duly delivered to it by the grower. In this way the usual reservations or arrangements for the following season's seed by the grower will be in line with the policy of standardisation. Approved seed wheats will, of course, be supplied by the Board, in lieu of the discarded varieties. With a view to ensuring the preservation of supplies of pure seed of varieties finally approved under the scheme, the Department will continue the work of seed selection by maintaining small nursery plots at its wheat-breeding establishments, or on other farms. Another object is the improvement by selection and the maintenance of certain strains within the respective varieties, which may be drawn upon should the identity or purity to type of the original varieties require to be renewed at any time. The active co-operation of seedsmen dealing in seed wheat is also being sought in connection with the scheme, in order that they may assist in placing varieties with growers in the districts or zones in which local conditions are considered most suitable for the varieties respectively allotted. The scheme generally is a practical one, and its effective working must have a wide influence on the future of the wheat-growing industry in Queensland.

Wheat Improvement.

Greater difficulty exists in Queensland in securing standard types of wheat than in any other State. A variety must possess certain characteristics before it becomes popular with growers. It must be rust and drought resistant, of good milling quality, possess a firm, upright, and strong walled straw, a minimum amount of flag, and a good, strong root system. It must also mature quickly, ripen evenly, be level headed in crop, possess a good, well-developed ear, have a capacity to hold grain without shedding it in the field, be easy to harvest, not too tough to thresh, and, lastly, it must be prolific in yield. For a quarter of a century the Department has carried on wheat trials and experiments with an aim of standardising types for different districts. For the last fifteen years wheat-breeding has been carried on at Roma by Mr. R. E. Soutter; and to increase the value of this work to growers progressive tests, such as those at present undergoing observation at Allora, are being carried out by the Agricultural Field Branch. It takes several seasons of variable conditions to thoroughly test a new variety to admit of a comparison being made of the behaviour and suitability of individual strains, and their adaptability to differing soils and environment. The work is progressive and calls for close observation and care to ensure the best results. As a result of long continued effort, many new and valuable wheats have been brought into cultivation by the Department, some being bred at the Hermitage State Farm—namely Bunge, Amby, Coronation, Piastre, Hermitage, and Plainsman. The Roma State Farm has also brought out some excellent varieties in Roma Reds, Cedrie, Warchief, Warrior, Novo, Inglewood, Gundi, and B.I.P. The adaptability of these varieties and their yielding capacity may be gauged from results obtained on the Downs by growers who have co-operated with the Department. Average acreage yields were in some instances over 27 bushels. Over the whole plotted area, 523 acres, the average yield was over 22 bushels to the acre in spite of seasonal difficulties. The highest yield recorded—this was in the course of the season before last—was 40 bushels (Roma Red 2) in the Allora district. In that locality comparative tests of several varieties of departmental wheats are now being made under field conditions on 3-acre areas. Fertiliser tests are at the same time being carried on by the Field Branch and results are awaited with great interest. The story of the development of wheat-growing in Queensland is a romantic chapter in our agricultural history. Our wheat breeders and field men who are fully and truly imbued with the spirit of Farrar to whose genius and perseverance Australians will yet raise a monument worthy of his great service to agriculture, to commerce, and to the Commonwealth.

Bureau of Sugar Experiment Stations.

FIELD REPORTS.

The Southern Field Assistant (Mr. J. C. Murray) reports to the Director (Mr. H. T. Easterby) under date 17th September, 1924:—

Childers.

Harvesting is in full swing, and mills are working at high pressure, with no industrial trouble. A general atmosphere of prosperity pervades the countryside, and growers generally are adopting the attitude of "sit up and take notice," more than hitherto. This is particularly noticeable with regard to soil improvement. Green crops for manure are being more extensively used, also deeper cultivation. Farmers are advised that on this soil Mauritius bean and cowpea are the best green-manuring crops. Mauritius bean has been proved to be the best green manure for typical red volcanic soils, such as prevail in the Isis and Woongarra areas. For further information on this point advice may be obtained from the Director of Sugar Experiment Stations.

There is still a great deal of work to be done by the growers here in respect to local experiment as a means of determining correct fertilisers. It is an everyday occurrence to meet a farmer who complains that he has invested a considerable sum in fertiliser with no results. This should not occur, unless drought conditions followed the application, if the correct mixture were applied. If a grower finds it not convenient to establish a plot for experiment, it is suggested that, when planting, he obtains a little of each of the standard fertilisers on the market and uses, say, a chain of half a dozen rows for experiment. This point has been stressed before, but is of so much importance that it is excusable to make repetition.

Cane varieties that are proving the greatest commercial value are Q.813, M.1900 Seedling, and H.Q.285. The lastnamed has frequently been recommended to growers since 1918 as a useful cane for this district, and gradually the planting of it has been extended with very satisfactory results.

A collection of varieties has been distributed at Huxley by the Colonial Sugar Refining Company. The writer is not yet familiar with their habits and manner of growth. They appear to be making satisfactory progress.

With the exception of a small area at Huxley under M.1900 Seedling, there is generally a healthy appearance about the cane in the Isis district.

Where disease occurs in old farm lands with any degree of frequency, it is best to give the land a rest from canegrowing and plough under legumes to restore fertility, and thus give subsequent cane crops that vigorous resistant condition that rarely allows disease to make serious inroads.

There appears to be an impression among farmers that Mosaic disease is new to Queensland. This is erroneous, as it was noticed as early as 1909 in many Queensland fields, the primary symptoms showing in several farms. Its incidence was on the decrease then as the damage done had been noticed by intelligent growers and effectually checked by careful selection. From careful observations it can be positively stated that there is now far less disease taking the form of an infectious chlorosis than there was in 1918. This can be explained by the fact that growers are becoming increasingly alive to the necessity of careful seed selection.

A variety known as B.208 was showing an infectious leaf disease when it was introduced a number of years before the period mentioned. Disease is mainly distributed by unconscious selection of bad plants.

Dallarnil.

Excellent crops are coming from the Dallarnil district this year. Motor lorries for haulage are coming into use, and are greatly facilitating the transport of cane when long haulage is involved.

Varieties giving good results are Q.813, D.1135, Rappoe, and Singapore. The firstnamed is recommended to be more extensively planted, also H.Q.285. The soil at present has abundant fertility. In order to maintain this condition, however, the farmers are recommended to maintain the fertility of their soil by green manuring wherever possible.

Dallarnil is a district of considerable possibilities. In addition to cane, the land is suitable for the growing of cotton, fodder crops, and grasses. The countryside is picturesque, and there is still plenty of room for rural expansion.

Booval.

This area is expanding, and affords a good example of how people will readily develop the land if there is a chance of making a fair living for themselves and their dependants. Harvesting operations are in full swing, growers being busily engaged in hauling to the railway siding.

The farming generally is good. The forest land would be improved by deeper cultivation and longer fallowing; lime and green manure would be beneficial on the majority of the farms that are accessible to cultural operations. The reaction of the soil is slightly acid. Samples of scrub and forest loams were taken for analyses.

Deep ploughing in the average land at Booval is to be recommended. If shallow cultivation is done, the substrata retains too much moisture after the rain and this favours the attack of indigenous fungoid parasites on the roots of the cane. If the substrata is turned up and exposed for a time it is probable the growers will have less trouble with root-destroying fungi.

Cane varieties recommended are M.1900 Seedling, H.Q.285, Q.813, and H.227. The lastnamed stands frost conditions well and should be a useful cane on low lands. This variety bears a resemblance to D.1135 in a number of characteristics.

Goodwood.

Cane is cutting well at Goodwood, especially the M.1900 Seedling. Other canes giving good results are Q.813 and H.Q.285. Land is being broken up and made ready for planting. Harvesting operations are proceeding smoothly.

The cane generally is healthy, no serious spread of disease showing. M.1900 Seedling appears to exhibit unhealthy symptoms more than the other canes, and growers are advised to work with the other two varieties mentioned on land that has been cropping the Mauritius Seedling for a number of years.

Maryborough.

Cane crops are cutting well. Areas are being extended, and it appears at present as if this pioneer sugar-growing district was again coming into prominence as a sugar-producing area. The farmers are a little behind though, in the matter of high density canes. Although there is a fair acreage of M.1900 Seedling and Q.813 growing, farmers are recommended to plant these canes more extensively still, as well as H.Q.285. The order of harvesting could then be H.Q.285 in July and August, Q.813 in September, and M.1900 Seedling over the remainder of the season.

Continuous experiment might be made with other varieties. Canes should be looked at as to their value from the following standpoints:—Sugar content, disease resistance, harvesting qualities, and milling qualities. The three canes mentioned are all commendable from these points of view. It may seem unimportant for a cane to possess harvesting qualities, but a clean, free-trashing cane does not necessitate burning, and on account of the trash falling away during growth does not harbour insects that may act as a media of disease infection. A good milling cane helps the factory to maintain a maximum efficiency, a factor which materially benefits the suppliers.

Other cane varieties making an excellent showing in the Maryborough district are H.Q.227, Q.970, and E.K.28.

Growers are recommended to experiment before extensively fertilising, or submit samples of soil to the Bureau for analyses.

Yerra.

Good crops are coming from this district. All the transport has to be done by the farmers over some very indifferent roads; therefore they are working under more disadvantageous conditions than their fellow producers in better organised areas. There is still a considerable acreage of farm land to be cleared in this district, most of it suitable for general agriculture. In fact, it is probable that this district will finally be cropped with cane, maize, cotton, and fruit.

Cane varieties giving satisfactory results are H.227, Q.970, Q.1098, Q.813, H.Q.285, M.1900 Seedling, and D.1135.

Old soils now being put under cane would be improved by green manures and lime before planting. The soil is of coarse texture with a slightly acid reaction, and is deficient in humus.

Pialba.

As elsewhere, this is the busy time for the Pialba growers. The crops are heavy and the wagon haulage considerable. Efforts are being made to open up the country between Nikenbah and the Mountain with a tramline. The route would involve no big cuttings or bridges and would traverse some fine agricultural country. From the heights known as the Mountain a magnificent panorama of land and sea is visible. The Hummock at Bundaberg can be plainly seen. It was at the Mountain that Mr. Bromley pioneered the coffee-growing industry, his sons still carrying on the work along with cane planting. It is on the Mountain slopes that still beautiful natural jungle parks are to be seen, with the handsome Flindersia showing his head above the jungle.

Growers have been usefully experimenting and have some excellent canes. The most noticeable of the varieties tried are M.1900 Seedling, Q.970, H.227, H.Q.285, Q.1098, Petite Senneville (Mauritius Seedling), Q.813, H.Q.77, M.189, and E.K.28. Two of these canes, H.Q.285 and Q.813, are particularly worthy of note. Growers are recommended to plant these two canes extensively.

On the older Pialba cane lands crops this year are fair, but growers will never get the maximum from these soils until they systematically green manure and lime.

The Northern Field Assistant (Mr. E. H. Osborn) reports to the Director (Mr. H. T. Easterby) under date 22nd September, 1924:—

Innisfail.

For the week ending 23rd August, 4,512 tons of cane, with a c.c.s. of 14.2, were crushed. Generally, the cane was very clean, and some high-density figures were being obtained, especially from Liverpool Creek. Although a large crop is expected, it will hardly be up to the earlier estimates, for a proportion of the late cut cane is unlikely to be harvested.

Density figures on an experimental block on Mr. M. Schilling's farm are interesting:—

Cane.	Class.	Age.	C.C.S.
H.Q. 458	First Ratoon	9 months	10.6
M. 89	First Ratoon	9 months	5.65
E. K. 1	First Ratoon	9 months	7.25
S. Singapore ..	First Ratoon	10 months	9.1
Q. 813	First Ratoon	10 months	13.45
7 R. 428	Plant	11 months	9.5

For Q.813 13.45 is remarkably good, and confirms the figures obtained from this cane during the first three and a-half weeks of the crushing, when its average density was practically $1\frac{1}{2}$ per cent. more than any other cane going through the rollers. This particular crop was grown upon medium to heavy ground which has been under cane for many years. Very many inquiries are being made for plants of this variety, and a number of paddocks are being planted with it.

South Johnstone.

Industrial conditions in this centre are remarkably good, no friction of any kind having disturbed working operations. The mill is steadily grinding away; large crops and some heavy crushings are reported. For the week ending 9th August, 6,733 tons of cane were treated for a c.c.s. of 13.2.

Generally, the cane was very much cleaner than in previous years, and was arriving at the mill much fresher than last season.

Arrangements were also being made to forward cane from El Arish and Ban Yan to the Invieta Mill at Giru upon completion of the North Coast Line.

Late cut plant and ratoon cane were backward. Young plant cane was not noticed to any great extent, nor had the early cut cane made much progress. Wet weather was the cause of this, for good growing conditions had not been experienced.

Grubs.—Much damage was observed, principally in the vicinity of Japoon, upon No. 3 Branch.

Borers.—Very little damage was noticed this year; one Japoon farmer, upon whose usually very badly infested farm Tachinid flies have been twice liberated by the Bureau of Sugar Experiment Stations, says that it is now hard to find damaged cane.

El Arish Soldiers' Settlement.

A short visit was made to this area, and conditions there were most encouraging. A little township has been established, consisting of two modern stores, a butcher's shop, and Post Office. Fair roads radiate to the several centres of the Settlement.

Some eighty ex-A.I.F. men are now settled there. Many of them are married. Families are housed in compact and neat little houses supplied by the Department, which, to judge by the gardens attached to many of them, are intended to become permanent homes.

To illustrate how the Settlement has grown—In 1922, 6,000 tons of cane were crushed; in 1923, 17,500 tons of cane were crushed; in 1924, 28,000 (estimated tonnage); and as 2,000 acres will be under for 1925 some 40,000 tons should be about the aggregate.

Badila is, of course, the main cane grown, but several growers are trying out E.K.28, M.1900, H.Q.426, Q.116, Sport, and 7R.428 (Pompey). Some growers are inquiring for Q.813 for the poorer classes of land.

Banyan and Tully River.

Good progress is being made in the erection of the mill. A large number of men under the Tramway Engineer are busily engaged in tramway work and bridge building. Numerous business places have already been opened, and a temporary school, with some seventy-eight children upon the roll, show that the place is rapidly forging ahead. A fair area of scrub has been felled this year, but wet weather has so far prevented much burning off. Wet weather has been constant, and it is surprising to see so much work carried out under such unfavourable conditions.

The cane was hardly as good as expected, probably having suffered in its early growth by the dry time then experienced.

Badila is the only cane planted so far, but it is quite likely that growers will be looking for a quicker-growing variety upon some of the poorer classes of soil in the area. Now that the North Coast Line is so near completion it is probable that growers may obtain cane plants from the Herbert River. Before obtaining any such seed, it would be well to remember the warning issued to Herbert River farmers by the Colonial Sugar Refining Company last November, in connection with Clark's Seedling and gumming disease, which was subsequently the means of declaring this variety a disapproved one.

Diseases.—Leaf scald was noticed in Badila in several scattered parts of the South Johnstone area, but so far not enough to cause alarm. Growers, however, are again warned to be very careful in their seed selection, and to use none but the very best of seed from a clean block of cane.

Babinda.

Very wet weather had been experienced in this district, the registrations being as follows:—January, 12.05; February, 13.22; March, 56.79; April, 29.27; May, 21.56; June, 9.58; July, 12.91; August, 5.89; September (up to 12th), 4.88; or a total of 166.13 in. Harvesting conditions were consequently hampered. Despite this handicap the mill was doing remarkably good work in every way, and in general the outlook was most favourable. Crushing was proceeding in a very satisfactory manner, some 79,391 tons of cane having been crushed up to the morning of 12th September. Out of this large tonnage only 60 tons had been burnt.

There were not any large acreages of either early or late young plant cane, nor were the recently cut ratoons as forward as they usually are. According to the mill figures the average density was low, although steadily improving, but some remarkably good densities were noticed from the northern end, numerous samples going over 17 and one 18.3 c.e.s.

Some fine cane was seen upon Bartle Frere, one of the blocks being a 27-acre block of sixteen months' old Badila of Mr. A. Mayer's; close alongside was a very

forward nine months' old crop of first ratoons which would easily cut 40 tons per acre now. This grower has planted in the red soil small blocks of H.Q.458, H.Q.409, Obo Badila, and Tableland Badila. The first two canes have grown well with good stools and length of cane, but would probably show up better proportionately in a poorer class of soil. H.Q.409 is considered a very good cane of high density upon some of the medium to heavy soils on the Herbert River. It is considered a slow striker, though, when planted early. Alongside Mr. Mayer's farm is a 42-acre block of eighth ratoon Badila belonging to Mr. J. Pryce. This should average nearly a 25-ton crop. So far it is under stumps and, of course, has not been manured.

Pests.—Although some damage was caused by grubs in the area it was far less than in previous years, and only in isolated patches. Very little borer affected cane was noted. Growers who formerly suffered severe losses through this pest speak most encouragingly of the good results obtained from the liberation of the Tachinid fly.

Diseases.—Leaf scald was observed in various parts of the area, but more especially in places where its presence had been noticed last year by the writer. N.G.24, N.G.24B, H.Q.426, and N.G.15 are the canes showing the symptoms.

In most cases ratoons show the disease to a far greater extent than the plant crop; second ratoons are also much worse than first ratoons.

In a small block of B.208 leaf scald was observed. Top rot was also noticed in Badila in places.

Manuring.—Growers are reminded that at present the local mill has a very valuable manure in Filter Press Cake. This is a fine manure in any ground, but on heavy, low-lying soil should be of the very greatest value.

Liming.—Several growers whose crops have not been too satisfactory are intending to try either burnt or crushed limestone for next year. As a great proportion of the heavy stiff soils are intensely acid, the result from such liming should be extremely beneficial.

Cane Varieties.—Among the newer varieties giving good results locally Q.813 must now be considered as a quick growing, early cutting, high-density cane. Mr. T. R. Stewart, of Fig-tree Creek, has just finished harvesting 126 tons of twelve months' old plant, giving him an average c.e.s. of 16.2, whilst 40 tons of twelve months' old first ratoons gave him an average of 16.4 c.e.s. This cane was all cut when the mill average was never above 13.5, and the season's average very much lower still. This crop was grown upon medium quality, fairly stiff soil, and had been under cane some ten or twelve years.

Trashing Cane.—In order to try and improve upon the expected low density figures due to such an abnormally wet season, several old and experienced Babinda canegrowers had blocks of plant Badila trashed. After allowing for costs they still are of the opinion that the increased density figures obtained fully justified the expense incurred.

CANE PEST COMBAT AND CONTROL.

Mr. E. Jarvis, Entomologist at Meringa, near Cairns, reports to the Director (Mr. H. T. Easterby) under date 19th September, 1924:—

CALCIUM CYANIDE *versus* CANE GRUBS.

Additional data in connection with the possibilities of hydrocyanic acid gas as a fumigant for our cane grubs has been just obtained (supplementary to that already reported in the "Australian Sugar Journal," vol. XV., p. 708; XVI., pp. 66, 325.

In a previous report it was stated that a dose of 60 grains of calcium cyanide (30 grains on each side of a plant) did not injure young cane shoots from 12 to 18 in. high.

Continuing these field tests, additional injections of from 80 to 200 grains per plant were administered between the dates 25th June to 21st July (6 in. from centre of plants and 6 in. deep), without noticeable effect on cane so treated.

When examining these test plots on 6th September (forty-seven days later) plants that had received 120 and 200 grain doses were found to be quite normal, and appeared to have made better growth on the whole than check plants alongside in the same row.

The above experiments were intended as a crucial test, in order to make absolutely sure this poisonous gas would not damage growing cane roots. Now, in

laboratory experiments made last February against grubs confined in cages of soil, 100 per cent. mortality was obtained from injections of only 15 grains. Assuming, therefore, that in field practice even double this quantity—viz., 30 grains (15 on each side)—should be required to destroy all the grubs under a cane stool, we could still, if needs be, apply more than ten times that amount per stool without risking injury to the cane.

We may gather from results already outlined that this fumigant is well worthy of future study and experimentation as a possible controlling factor against grubs of our grey-back cockchafer.

The cost of treating an acre with calcium cyanide flakes works out at about £2 15s.; which would allow for the injection of 8,580 stools with doses of 30 grains per stool.

FIGHTING THE SUGAR-CANE TERMITES.

The "white-ant" problem on the Burdekin is receiving attention at our laboratory; the activities of the large termite (*Mastotermes darwiniensis*, Frogg.) having caused considerable anxiety of late to several growers at Jarvisfield and elsewhere.

We are experimenting at present along two important lines of control, both of which are yielding encouraging results, and may warrant the carrying out of field tests later on.

The most promising of these is fumigation of the soil with para-dichlor. at planting time, or directly the young cane-shoots make their appearance above ground. Such injections would undoubtedly protect the "sets" from invasion, by rendering the earth surrounding the roots repellant throughout a strip of soil 2 to 3 ft. in width during a period of at least two months. This would enable the stools to become well established and better able to resist attacks that might come later on.

(1) Fumigation with Para-dichlor.

On 26th August an experiment was carried out to determine the effect of para-dichlor. on larval and soldier forms of *Mastotermes darwiniensis* Frogg.

Twelve cages of moist soil, each containing five "white-ants" buried about 3 in. deep alongside a small section of cane-stick were prepared, five of these cages being treated with 1-32 oz. and five with 1-16 oz. doses of crude para-dichlor., while two cages were left untreated, as controls. The fumigant was buried about 2 in. above the termites. Four days later, upon examining three of the cages given 1-32 oz. doses, Mr. F. H. Taylor (Assistant Entomologist) found 25 per cent. of the termites to be in a moribund condition, and the remainder dead. An examination of three cages that had received 1-16 oz. doses showed all termites dead, some being in an advanced state of decomposition. Inspection of the remaining six cages on 2nd September (one week from date of application of fumigant) gave a mortality of 100 per cent. in the treated cages, but no sickness or death occurred in the two control cages.

The above experiment was repeated with very similar results on 9th September, twenty treated and five control cages being used, each containing twenty specimens of the common "white ant" (*Termes meridionalis*). This species was more quickly affected by fumes of para-dichlor. than *Mastotermes darwiniensis*; most of the workers, nymphs, and soldiers of the former ant being found dead forty-eight hours after application of the 1-32 oz. dose.

(2) Dipping "Sets" in Arsenical Solutions.

The two chief arsenicals being tested here at present for controlling white ants are arsenate of copper and lead arsenate. The latter form, although less deadly, has the advantage of being much cheaper, and is not so dangerous to handle. Four strengths of lead arsenate were tested, consisting of from 1 to 4 lb. of the poison in 24 gallons of water.

Short pieces of cane-stick, after being immersed in the various solutions and well shaken about to ensure even wetting of all portions, were first allowed to dry and then placed in cages of soil, each of which contained five specimens of *Termes meridionalis*. The sets were placed 2 in. above bottoms of cages, and the termites 1 in. below these buried pieces of cane.

A couple of cages of the 1 lb. in 24 gallons and two cages of the 2 lb. in 24 gallons were examined after a lapse of four days, when all of the white ants in these cages were found to be dead.

The remaining sixteen cages were opened up after a further interval of four days, with exactly similar results, every termite being dead; while all those in the five control cages were alive and healthy.

The above results indicate that the termites in each cage had worked towards and discovered the sets, and then attempted to eat or tunnel into them.

CANE PESTS OF BURDEKIN DISTRICT.

This district was visited by us last August, in order that control work might be instituted against cane-grubs and other insect pests, which during the past season have done rather serious damage to cane in certain localities. Mr. G. Bates was instructed to proceed to Ayr, and in collaboration with the secretary of the Lower Burdekin Pest Destruction Board, Mr. W. M. Saxby, carry out fumigation work with carbon bisulphide against grubs of the grey-back cockchafer, and at the same time test the effects of this fumigant upon the large white ant, *Mastotermes darwiniensis* Frogg. Grubs were found to have finished feeding, but had not pupated, and were located at depths varying from 4 to 18 in.

Rows of cane, measuring collectively a length of about 10 chains, were fumigated on a farm belonging to Mr. Tapiola, where the soil was of a sandy-loam character. Injections of carbon bisulphide were administered from 12 to 18 in. apart and 9 in. deep, just above the grubs, which had previously been found lying at an average depth of 10 in. from the surface.

Twenty-four hours after application of the fumigant six stools were dug up from where injections had been made at distances of 1 ft. apart, and grubs were found at depths of 6, 8, 13, 12, 10, 12, 12, 7, 10, and 14 in.; all being dead.

Five stools from a row where injections had been made 18 in. apart, yielded grubs at depths of 8, 12, 11, 16, 8, 18, 9, 8, 16, and 14 in., and all were dead.

The ravages of the large white ant were of a serious nature on some of the farms visited. Cane planted in May and during July and August appears to be very subject to attack, and on low-lying alluvial flats this pest was observed damaging both young and old cane. On one 5-acre block of Badila, situated along the bank of a creek cleared in 1913, where termites have been troublesome for the last three years, the proprietor, Mr. Kainp, estimates a loss this season of about 10 tons to the acre. (*Note*.—Growers are referred to heading "Fighting the Sugar-cane Termite," in another portion of the present report.)

Fumigation of termite-infested stools was carried out on the farm of Mr. J. McLean, the bisulphide being applied on each side of some affected rows of cane, while injections of 1 dr. 55 minims were put in 4 in. from the plants, 4 in. deep, and 12 in. apart.

When digging under stools about four hours after application all termites found were dead, but a couple of days later, when digging up treated stools, living termites were found in every case, and no odour of bisulphide could be detected in the soil.

This may have been due to fresh invasion of these stools by termites located outside the fumigated strip, since fumes from carbon bisulphide are not deadly for longer than about twenty-four hours after application in some classes of soil, especially during dry weather when the ground is very open for fumigation.

On the other hand it is possible for many of the white ants to escape the influence of such treatment, owing to failure of the fumes to penetrate into closed tunnels, &c., in the sets or basal portions of stools.

The large moth-borer occurred rather plentifully in young shoots of ratoon and plant cane. Various other insect pests of minor economic importance were observed.

CANE PESTS AND DISEASES.

The Director of the Bureau of Sugar Experiment Stations (Mr. H. T. Easterby) has received the following report (18th September, 1924) from Mr. W. Cottrell Dormer, who is investigating pests and diseases:—

HERBERT RIVER.

Diseases.

Most of the more important diseases are known to occur in this district, but none have arrested the public attention more than the gumming disease, and, true to report, many sugar-cane fields were found affected. As has been the case with gumming disease in previous epidemics it is that variety which has attained the

highest popularity, which has proven itself most suitable to the infected district, and that has been found the most susceptible to the disease. On this occasion that variety is the well-known Clark's Seedling (H.Q.426). The epidemic is at its worst in the Halifax locality, and in the strip of country lying between the Macknade Mill and the coast near the river. In these parts really serious damage is being done and much cane is actually dying because of the disease. Though the actual damage is not so great in the areas lying about Victoria Mill and east of Ingham—including Gairloch and Ripple Creek—yet the infection is almost as great, as almost every field of Clark's Seedling shows at least the leaf symptoms of gumming disease. Moving in the opposite direction—i.e., west from Ingham—one gradually leaves the main zone of infection until reaching the upper cane lands of the Stone River and the head of Long Pocket, where very little gumming if any at all occurs.

Leaf scald disease, which has at times wrought much damage to sugar-cane in New South Wales, was encountered several times during my inspections. It has been known to occur in this district for a great number of years. However, some of the more recently introduced varieties are proving their weakness under the local condition. This remark would apply especially to Nanemo, Arambo, and Korpi, in order of susceptibility. Close to the Victoria Mill a field containing the three varieties was shown to me as being one of the worst-infected fields of the district. The damage to Nanemo was very serious indeed, and many blank spaces marked spots were one or more stools had succumbed altogether. The remainder of the crops was markedly stunted. The disease was seen also at Halifax, Seymour, and on the Stone River.

A form of control of planting, as rigorous as can be under the circumstances, is being carried out for the Colonial Sugar Refining Company by Mr. K. R. Gard, to whom I am indebted for assistance in the field and otherwise. Mr. Gard is working under the greatest of difficulties as there are a few farmers who persist in planting diseased cane in spite of warning. Such farmers are naturally a menace to an agricultural community which is striving hard to improve its crops.

During my stay at Halifax a combined lecture and practical demonstration on the subject of sugar-cane diseases and insect pests was given conjointly by Mr. K. R. Gard and myself at the invitation of the Halifax Planters' Club. Stress was laid on the infectious nature of gumming and other diseases, and preparations of the gumming bacillus and of the mouth parts of probable disease-carrying insects were made in the presence of the meeting and shown through a high-power microscope. The value of the lecture was very much enhanced by a series of coloured illustrations of cane diseases supplied by Mr. Gard. The meeting was well attended and well appreciated.

Other diseases found doing appreciable damage, especially to Badila, are Top and Root disease. These diseases are fairly widespread throughout the district, but it seems that Long Pocket, where a great deal of Badila is grown, has been the greatest sufferer in this respect.

Insect Pests.

Grubs of the grey-back cockchafer have done serious but not extensive damage in certain localities—Ripple Creek, Gairloch, Seymour, Halifax, Cordelia, Stone River, and Long Pocket. In most cases only small areas have been seriously injured, and in all cases the soil should prove suitable to fumigation with para-dichlor or other fumigants, being for the most part loose and sandy and close to river or creek banks. While following the plough in certain fields I came across several other species of grubs, belonging mostly to the family Anoplognathidae, and including probably the "Golden Beetles" and "Green Beetles." As all these beetles are collected during the flying season and paid for, the various bodies who have charge of collecting will be pleased to learn the results of the breeding operations being at present made at Meringa, where the Entomologist is studying the economic importance of these several species.

The "Black Set Beetle" (*Pentodond australis*) has been recently noticed doing very slight damage to young cane plants on the Stone River. The "Beetle Borer" and the "Large Moth Borer" were found doing more or less damage throughout the district. To control the former and more important insect, the Colonial Sugar Refining Company have for some time past been liberating Tachinid flies. Our Entomological Laboratory has also at times assisted in this respect. Several species of leaf-hoppers unknown in the Cairns district were observed.

MORETON DISTRICT.

Diseases.

Disease in this district is well marked. Things have not gone so far that they cannot be remedied, but laxity on the part of growers, if continued, will in the course of a few years bring about very severe loss. I am referring especially to gumming disease. Here, as elsewhere, it is the most favoured variety which is most affected—D. 1135. The actual damage is not very serious and in most cases the disease is to be noticed almost exclusively in the leaves of the affected canes. However, the infection is very widespread and extends throughout the Maroochy district, from Coolumb to Bridges, Bli Bli, Rosemount, Petrie Creek, and Image Flat, and probably in other parts which I was unable to visit. The extent of cane actually showing gum badly is comparatively small. However, the disease is present in most localities and is merely awaiting suitable weather conditions to break out at its worst and cause very severe loss to growers in sugar content and in tonnage and to millers because of the refractory nature of "gummed juice," and the natural sequence will be a discardance of D. 1135 and perhaps of other valuable canes. Cane growers of old standing in this district remember a similar occurrence in years gone by. It cannot be too strongly impressed upon the growers as a whole the fallacy of the happy-go-lucky agricultural practices by the many—the "that will do" spirit. Now is the time for the Moreton growers to act and to act quickly. Here is a suggestion:—Whilst in the Moreton district I made known to many growers the peculiar leaf markings which show the presence of gumming disease; wherever I found the disease I remained until I was quite satisfied that the grower could, unaided, detect the disease by these leaf-markings. These growers (who constitute a goodly number) should not only abstain from selling cane to others for planting but each should invite his neighbours to come and be made acquainted with the disease. He could then show them, as I showed him, how to detect the disease. This question should also be discussed at local farmers' meetings and specimens should be brought by growers for demonstration. Having learnt the symptoms, each farmer should discard for planting purposes any field showing the least trace of gumming disease, and before buying cane for plants elsewhere he should personally inspect the standing crop; he should also plough out diseased cane as soon as he is able to afford to do so. Other varieties showing gumming disease are, in order of infection:—Hambledon Seedling (H.Q. 285), Gingila, Malagache, and Q. 813. Although Q. 813 is grown here to a great extent only one field was found which showed gumming disease—a young plant crop adjoining a badly diseased field of D. 1135.

Mosaic disease, known about here as "Leaf Mottle" is also very prevalent, and infections of greater or less extent were found in every district visited. This also is a dangerous disease, causing a great stunting of affected canes and sometimes total loss. Some varieties are, of course, more susceptible to injury from Mosaic than others, but it has been proved in Hawaii, the West Indies, Southern United States, and other great sugar-producing countries, that diseased cane is never able to produce maximum results. Next to Shahjahanpur 10, the variety showing most disease is M. 1900 Seedling; D. 1135 is also more or less infected and the effects of the disease are rather marked in this variety. One case of Leaf Scale disease was noticed where two stools of D. 1135 showed early symptoms.

Insect Pests.

Under this heading there is but little to mention. The most serious insect pests of sugar-cane here are an Anoplognathid grub and the "Black Set Beetle." Both of these bore holes in the freshly planted sets, destroying roots, eyes, and shoots. The worst of the damage takes place where a first crop of cane is planted on land which has up to this time grown *Paspalum* grass. Both beetles and grubs live on the roots of this grass. When the grass is destroyed they attack whatever is planted in its stead. As the soil is always very loose about affected cane—it being but lately planted—there seems to be no reason why these pests could not be effectively controlled with carbon bisulphide. About $1\frac{1}{2}$ acres per day per man at a cost of £3 10s. per acre or less could be done with a Dank's injector. Only one side of the plant would need to be treated. Distribution of the grubs and beetles in a field could be ascertained by occasionally pulling up a plant here and there. It would be a good plan for local farmers' associations to purchase one or two injectors and a few drums of carbon bisulphide which could be supplied to growers in their emergency.

Grubs have been and are being sent to the Entomologist for purposes of study.

Mole crickets have been known to damage sets in some farms along the Maroochy River. The large moth borer is widely distributed about here, but is doing very little damage.

A UNIVERSAL INDEX TO WOOD.

E. H. F. SWAIN, Director of Forests.

Paper read before the recent Science Congress at Adelaide.

However insignificant a plant, or mighty a tree, the systematic botanist is able to clothe it with an inescapable though often polysyllabic identity. The geologist similarly has conquered his rocky kingdom, and not a pebble on the ground but his quick eye has determined it and recorded it for all time in the geological tomes of the nations. The whistle of the bird upon the tree and the manner of the ant upon the soil have all been recorded and catalogued by avid explorers in science, and scarcely a living or a dead thing does there appear to be left upon the face of the earth that has not been set in its due place in the written inventory of science—except wood.

There are 5,000 woody plants in India, and there are perhaps five times 5,000 species of woody plants upon the face of the globe. The plants themselves are recorded and docketed, but their woods are lost in superficial samenesses. When one contemplates the sameness of bits of wood, it seems scarcely possible to split that sameness into 20,000 odd but constant differences. In sorting out many thousands of pieces of wood one is confronted immediately with a shortage of factors, a seemingly mischievous inclination to variation of even these limited factors, and a greater or less degree of overlapping. Some factors peter out after a few species are dealt with, some factors are evanescent, some factors are specific, some generic, and some merely adventitious. Some wood is perfumed, yet not all people have the same keenness of scent, nor is perfume in wood always a permanent character. Colour is as variable almost as the shade "by the light quivering aspen made," and blackbutt may be yellow or pink. Both karri and jarrah are red hardwoods of the eucalyptus genus, and the controversy as to which is which still rages in Western Australia, the home of both. Annual rings may be fine and crowded, or wide and open, in the same species according to the rate of growth. The same wood may sink or float in water according either to its state of dryness or its condition of density. Yet in different specimens of wood of the same species the specific sameness persists. What, then, constitutes specific sameness?

Composition of Wood.

Wood is composed of bundles of vertical tubes, thatched together with horizontal medullary rays. In porous woods the tubes are hollow, and appear on the transverse section as pores. In coniferous woods the tubes are sealed and the transverse section is non-porous. A survey of the transverse cut really sums up all the major factors of wood. The vessel lines on the longitudinal facies of wood have been adopted as a factor. Importance has been attached to the distribution and arrangement of the pores, the width of the rays on the transverse section and similarly their degree of discernibility to the naked eye, and the visibility of the ray ends on the tangential surface have been employed also. But no definite mode of classification of the woods of the world has so far been announced. In pondering upon the matter over a long period of years, I have gradually brought into focus in my mind the belief that a count of both pores and rays upon a sufficiently wide field of the transverse cut is a virtual summation of all the qualities of porosity and of ray size and distribution.

Upon this belief is founded the system of classification, which I offer as a possibly universal method of indexing woods. I have, of course, had the porous woods most in mind, and provision is left in the system for the inclusion of the non-porous woods, but that important series is not by any means disposed of, and the task is in a large measure relegated to later times, briefly because recourse must be had to microscopic examination. What I style the ray-pore plot is, therefore, the basis of the system. This is an encircled plot on the clean transverse cut, having a diameter of one-fifth of an inch, or five millimetres. Within this circle both the rays and pores are counted carefully with the aid of a hand lens. A surprising count-constancy for both rays and pores was found to exist for the species, although a measure of variability was noticed. But obviously if the count of pores and rays varied greatly, specific sameness would cease, and wood of one species of tree might be transmuted into another species. Red cedar might become white cedar, and bolly gum become maple, and so on. Even so, the transmuted woods would still be rightly grouped. For wood must be known by its characteristics of structure weight and colour, and not by its botanical relationships. Wood, however, does not vary so greatly.

Decimal Filing System.

After many futile attempts to found a system upon classic methods, the discovery of the significance of the ray-pore plot paved the way to the method which is enunciated in this note. The ray-pore plot alone was, however, insufficient. In view of the limitation of factors, and the limitation of range of those factors, it became obvious that any system of identification must be founded upon a method of factor combination and the need for an appropriate vehicle became pressing, as dichotomous vehicles had proven indefinite and bewildering. At this juncture I stumbled upon the decimal filing vehicle. That system has been the cage wherein have been made captive the main factors of wood identification. The decimal filing system has made possible the analysis of wood factors and their sorting out into major, minor, and adventitious, generic, specific, and accidental factors. In the process the factors that really count, the factors of specific sameness, have been isolated and fixed. They are the factors relating to the distribution of the pores and rays and soft tissues, by ringing the changes of combination of these major factors, and by an occasional dash of colour or perfume, Nature has succeeded in producing 20,000 plus different kinds of timber from very few ingredients.

The major factors being isolated, the next thing was to build them into a series of combinations adequate to account for all manner of woods. That a classification of woods could not be devised which was coincident with or parallel to the pseudo-natural botanical system of to-day became established at an early hour. Woods of the same botanical genus differed almost fundamentally in weight, colour, and density, and woods of different genera or even family might be identical in these respects.

The Purpose of Classification.

In any case, the purpose of wood classification was chiefly industrial, and an industrial basis of classification appeared to be requisite. Whilst this industrial basis was adopted for the index, however, the closest approach to a botanical arrangement was sought also, and it may be claimed for the system here set forth that some botanical correspondence of species has been maintained within the limits of the primary commercial arrangement. The completed list provides for some 200,000 different woods, and it will bring fairly well together in their due place in an ascending order of density woods of the same genus and order. The 200 separate species of eucalypts whose woods so much resemble each other as to make it impossible to do otherwise than merely group them into classes, are more or less isolated under the system with some approach to botanical precision, and the problem of the karri and jarrah twins is apparently solved.

Variation Difficulties.

There remains in the woodpile the nigger of variability and similarity. The same nigger, however, pops up also in the herbarium and with similar inconvenience to science. The decimal indexing vehicle affords exceptional facilities for disposing of difficulties of variation and overlapping by the method of cross-referencing, so that a single piece of wood subject to variation may be represented not exclusively by one number, but by several, none of which, however, will be duplicated ordinarily by any other species of wood. Eventually all variations will be tagged under the scheme and fixed. Finally, a list of check tests is available for application in the event of two or more very similar woods, finally coming together.

There are, of course, the difficulties of variation in the observer himself as well as in the material. Some observers are not as precise as others, some have better eyesight than others, and may count more pores and rays. The knife may be blunt or the transverse cut blurred. The index is not fool-proof; but endeavour has been made to accommodate it to an average observer, by not relying upon a precise count of rays, and pores, but by allowing a range of 10 or 20 in the case of rays and 50 plus in the case of pores. Any two moderately careful observers should be able to get within 20 or 30 of each other in the count of pores. If, however, the count approaches the limit of the range, it is cross-referenced to the next decimal.

Indexing Scheme.

A brief description of the universal wood indexing scheme is as follows:—Wood is divided into twenty-four primary groups according to the microscopic features of weight, porosity, and colour. There are four rough and ready grades of weight determinable by what may be styled "sinkability" in water. These are:—(1) Very light soft woods; (2) medium soft woods; (3) medium hard woods; (4) very heavy

hard woods. Each of these four groups is subdivided into three sections according to the degree of porosity discernible on a transverse cut. This subdivision roughly isolates the coniferous group, the boxwood group, and the open-grained group. Colour is employed finally to group woods into two broad classes—namely, pale coloured and deep coloured. This primary grouping of woods is purposely a rough one, on the idea that the schedules of integers and decimals represent a series of sieves, the first of which is very coarse, and seeks only a preliminary sorting out, relying upon the subsequently finer and finer sieves of the series gradually to sort out the woods to the final unit. It provides for a broad trade classification in an ascending gamut of density and weight from very light coarse-fibred woods to very heavy fine-grained woods, thus the higher the number, the heavier the wood; odd numbers represent neutral coloured woods, even numbers deep coloured woods.

Decimal Schedules.

Following upon this preliminary grouping of woods, resort is had to four decimal schedules to further subdivide. The first decimal, by a count of the number of rays intercepted by a 5-millimetre circle upon a transverse cut, ranges the woods of each group in an ascending scale of density. Not only so, but the method has family and generic significance, and proceeds to bring together woods of the same order and genus.

The first decimal arrays the woods more or less precisely into family groups within the primary groups.

The Proteaceæ, Monimiaceæ (*equestifolia*), and Sterculiaceæ (except *Casuarina lepidophicia* and *Casuarina equestifolia*), and Sterculiaceæ (except *Tarrietia*), and several genera of the Monimiaceæ, all come with the 0-10 ray group (decimal .0). The Clacineæ, Celestrineæ, and the genus *Tarrietia* of the Sterculiaceæ are covered by the 11-20 ray group (decimal .1), whilst such orders as Tiliaceæ, Hubiaceæ, and Loganiaceæ, and the genera *Eugenia* and *Rhodamnia* of the Myrtaceæ, all of which have rays of two sizes, are cross-indexed under this decimal from the 60-80 and 80 and other groups. The genera *Daphnandra* and *Doryphora* of the Monimiaceæ also come within this group.

The 21-40 group (decimal .2) covers the Capparidæ, the Burseraceæ, and the Araliceæ, Apocynaceæ, the Boraginææ, and the Phytolaccaceæ, and most of Celastrineæ. The Meliaceæ are represented only by the Meliæ and the Cedrelæ, otherwise its genera are scattered over all the higher ray groups up to the last, namely, 81 and over, where *Anisura* appears. The Verbanaceæ are represented by the *Omelina*, and the *Laurinède* by the *Cinnamomum* and some of the Cryptocarvæ. The Anonaceæ connect this ray group (decimal .3), which contains the Solanaceæ and most of the Laurineæ, all the Logumineæ except *Albizia* and *Pithecolebium*, which extend into the 61-80 group, the genera *Pittosporum*, *Hymenosporum*, and *Bursaria* of the Pittosporææ, the genera *Erodia*, *Zanthoxylum*, and *Geijera*, of the Rutaceæ, the genera *Flindersia*, *Owenia*, and *Dysoxylon*, of the Maliceæ, and the genera *Vitex* and *Cleordendron*, of the Verbenaceæ.

In the 61-80 ray group (decimal .4) the Sapindaceæ and the Hyoporineæ appear, and the Hyrtaceæ are well represented by the genera *Melaleuca*, *Angophora*, *Synerpia*, *Eugenia*, *Tristania*, and *Rhodamnia*. The Rutaceæ are also represented strongly. So also are the Saxifrageæ.

The final group (decimal .5) with rays numbering more than 80 per 5 millimetres produced the orders Ebenaceæ and Sapotaceæ, whilst the Myrtaceous genera, *Eucalyptus*, *Xanthostemon*, and *Backhousia*, occupy a large place within it. The Myoporineæ are represented by *Eremophila*, the Simmarubæ by *Cadellia*, and the Bixienæ by *Scolopia*.

The second decimal effects a further breaking up of the family groups and genera. The effect is both generic and specific, but, although the decimal has some botanical significance, the septation and arrangement of the pores do not coincide with botanical values. The factors of decimals .08 and .09 are possessed only by the Myrtaceæ, principally by the genus *Eucalyptus*, but other individuals of the Myrtaceæ fall also under decimals .05, .06, and .07 in association with the Casuarineæ. Decimals .03 and .04 claim the Proteaceæ and a few of the Verbenaceæ. Decimals .00 and .01 and .05, however, sort out and divide up all the other orders.

The third decimal, which relies upon a count of the pores within the 5-millimetre circle, is distinctly specific in effect, and shows a limited variability, which is also specific in character.

The fourth decimal deals with soft tissue, its occurrence and arrangement. It is a factor of botanical significance, and follows the natural orders more closely than

do any of the other preceding decimals. The development of soft tissues is, however, often only partial and uncertain, and it is this indefiniteness which precludes the earlier application of the factor.

The value of each decimal schedule, however, is not intrinsic, but lies in its capacity for combination with the others, and in the potency of these combinations in reducing the larger groups to smaller groups, and the smaller groups to the unit species. It must never be overlooked, however, that the index factors do not include length, strength, or straightness of the fibres, and woods otherwise similar may be brought into numerical sequence only to be separated again by the check factors relating to fissility or interlockedness and length of fibre. Thus river red gum and grey ironbark happen together because the index factors are practically identical, but red gum is wavy grained, dull, and somewhat brittle, whilst ironbark is straight grained, bright, and elastic. In such cases the burning test is often an effective check factor. Thus, grey gum sparks off without leaving ash, but ironbark leaves a tawny ash. There are a number of such cases, particularly among the eucalypts, of which there are over 200, nearly all single-pored hardwoods.

It would be possible to prepare a fifth decimal schedule relating to the factors of the longitudinal sections of wood, but the four existing schedules leave very few woods to be further subdivided. It would be possible also to incorporate the longitudinal factors in the primary groups, but this scarcely appears to be warranted.

WHEAT CROP PROSPECTS.

Although the recent general rains proved to be somewhat light in some localities, there is every reason to take an optimistic view of this year's prospective wheat yield. Present prospects indicate this should be almost on a parallel with that of the 1919-20 season (3,707,357 bushels), which constituted a record. The average then attained—20.91 bushels per acre—is still well in advance of any similar yields in the Southern wheat-growing States; as a matter of fact, our average wheat yield over a ten-year period is higher than that of the Southern States, exclusive of Tasmania.

The general excellence of this year's crop is undoubtedly due to the good rains experienced during the last ten weeks. In only four districts—Nanango, Dalby, Inglewood, and in the vicinity of Mitchell—was the July rainfall below the average. During August the precipitation was slightly below normal in the Toowoomba, Oakey, and Pittsworth districts, but everywhere else throughout the wheat-growing belt the rainfall both for July and August proved to be well over the average, a circumstance, in conjunction with the beneficial September rains, quite sufficient in itself to engender that spirit of optimism to be met with almost everywhere at the present time.

The general nature of the rains may be gauged from the records taken between 7th July and the present date:—Mitchell 401, Roma 491, Wallumbilla 426, Miles 371, Dalby 309, Jondaryan 308, Toowoomba 488, Pittsworth 498, Cambooya 423, Clifton 335, Pratten 443, Allora 322, Emu Vale 352, Warwick 470, and Goondiwindi 399 points respectively. Other centres registering less than 3 in. for the period under review were Bell 207, Jimbour 248, Oakey 257, Inglewood 264, and Milmerran 275 points respectively.

Obviously, there are factors other than the actual precipitation occurring during the development of a crop which exert an influence on yields. One very marked feature this year is the difference to be observed in the appearance and prospect of crops grown respectively on well worked, fallowed land, and land prepared just prior to the planting season. Those on the well-worked fields bear silent testimony to the benefits derivable both from good cultivation and from having a supply of stored moisture in the subsoil for the crops to draw from.

Observations made by departmental officers in late September indicate that a severe frost on 5th August caused an appreciable amount of damage at the time to crops between such far distant localities as Inglewood and Roma, but vigorous growth induced immediately after from the stool by beneficial rains, soon made up for the temporary check. It is, of course, always possible for rust to exact its toll in the way of a percentage of the average yield, with its corresponding effect on the quality and plumpness of the grain; however, with any sort of luck and granted another fall of rain in the Downs districts to help the late crops, and a freedom from humidity for the next few weeks, wheatgrowers should be able to look forward to good yields, a good quality of grain, and as the world's wheat market is buoyant—to good prices also.—H. C. QUODLING, Director of Agriculture.

SEED MAIZE IMPROVEMENT.

By C. McKEON, Maize Specialist and Assistant Instructor in Agriculture.

For a number of years systematic effort has been directed towards the improvement of several strains and varieties of maize, more particularly for Southern and Central Queensland. Excellent yields have been obtained, both in the departmental stud-breeding plots and where the improved stud seed has been grown on privately owned farms, indicating that, when a suitable variety is chosen for a locality and consistent care given to cultivation and seed selection, a new vista of increased returns has been opened up for the grower of this popular crop.

The scheme of seed maize improvement carried on by the Department involves a good deal of highly technical work, and a close study of the botanical characteristics of the maize plant.

Few cereals are more readily susceptible to cross-fertilisation than maize, and for this reason deterioration in type, quality, and yield are inevitable unless some well-organised scheme of improvement be adopted by growers. Evidence is not wanting of the excellent influence exerted in certain localities towards the establishment of a good class of grain by the effort of often one grower who specialises in seed maize, and selects a type to suit conditions existing in his own locality or district. Obviously, however, standard types of grain will not readily be obtained by a number of growers working independently of each other.

Recognition must be given to the zeal of the individual who sets up a standard in the matter of a grain type, and works consistently year by year to maintain it. There is, however, a limit to the scope of independent work of this description. Localised effort, if sound in principle, must also be sound in practice. As soil and environment naturally play their part in evolving plant and grain types, it follows that "place effect," in so far as it applies to seed maize selection for the State as a whole, is a matter which can only be effectively dealt with by establishing and working to fixed standards for improvement, based on scientific principles. This, briefly, is one of the reasons for setting up a departmental organisation to improve the type and productivity of Queensland-grown maize. In this latter connection, results justify an optimistic view being taken of the effect of the policy adopted of establishing pure types of seed, testing out individual ears therefrom to ascertain the relative productivity of each, and then propagating from the proved high-producing strains to ultimately provide bulk seed for sale to farmers.

Effort has been directed throughout to co-operate with individual growers in different districts, so that the farm on which seed improvement work is being carried on by the Department may be made the centre from which supplies of a particular class or variety of grain may be distributed. Observation goes to prove that the system outlined is gradually having the desired effect. Touching the question of high productivity and the improvement to be looked for by the establishment of seed maize of known capacity to give a good yield when conditions are favourable, certain cases are cited to show that the average yield of the State leaves much to be desired, as the average for the ten-year period ending 1922 was only 21 bushels per acre. One farmer in the Mary Valley threshed 117 bushels per acre of Improved Yellow Dent from an 8-acre field, and stated that by the employment of departmental seed he increased the average yield on his farm by 40 bushels per acre. Another grower, in the same district, threshed 116 bushels per acre of Reid's Yellow Dent from a 6-acre plot—a remarkably high yield for a four-months variety.

Again, at Kilcoy, where Golden Beauty, a five-months corn, appears to suit local conditions, a yield of 93 bushels per acre was harvested from a 4-acre field.

Star Leaming, on which careful selection work has shown a marked improvement, is another four-months variety which does well both in the coastal and intercoastal districts. When sown to allow for the tasselling period to synchronise with the wet season, it has proved itself to be a most consistent yielder, returns of upwards of 80 bushels per acre being not uncommon.

Good results have also been obtained with Funk's Yellow Dent, another four-months corn; up to 70 bushels per acre being harvested.

Funk's 90-Day, a dent corn, possessing a small, bright, hard-textured, attractive grain, has been much sought after by growers wishing to take advantage of a short growing season. For a 90-day type (it actually takes 110 days to thoroughly ripen to fit it for threshing direct from the field), it has shown itself to be a consistently high producer; up to the present the best return under field conditions being 69 bushels per acre—admittedly a big return for an early maturing variety. Ample evidence is forthcoming of the improvement in the type of grain met with at district shows and in the market, also in the yields obtained by individual growers who have been using departmental seed. To maintain this improvement steps are taken each year to raise sufficient pure seed to sow several thousand acres of maize, thus giving a direct and practical application to the scientific system of seed improvement undertaken.



PLATE 84.

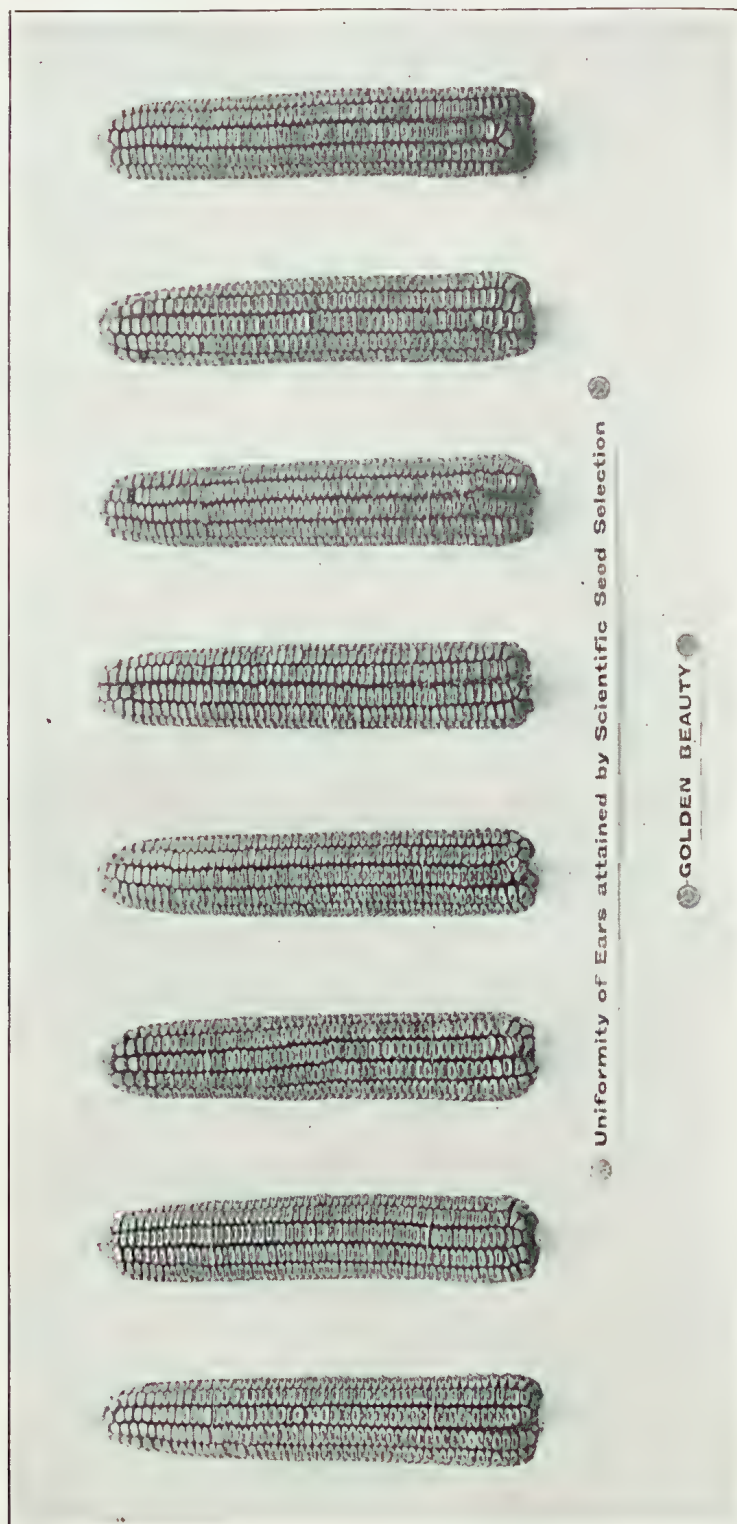


PLATE 85.

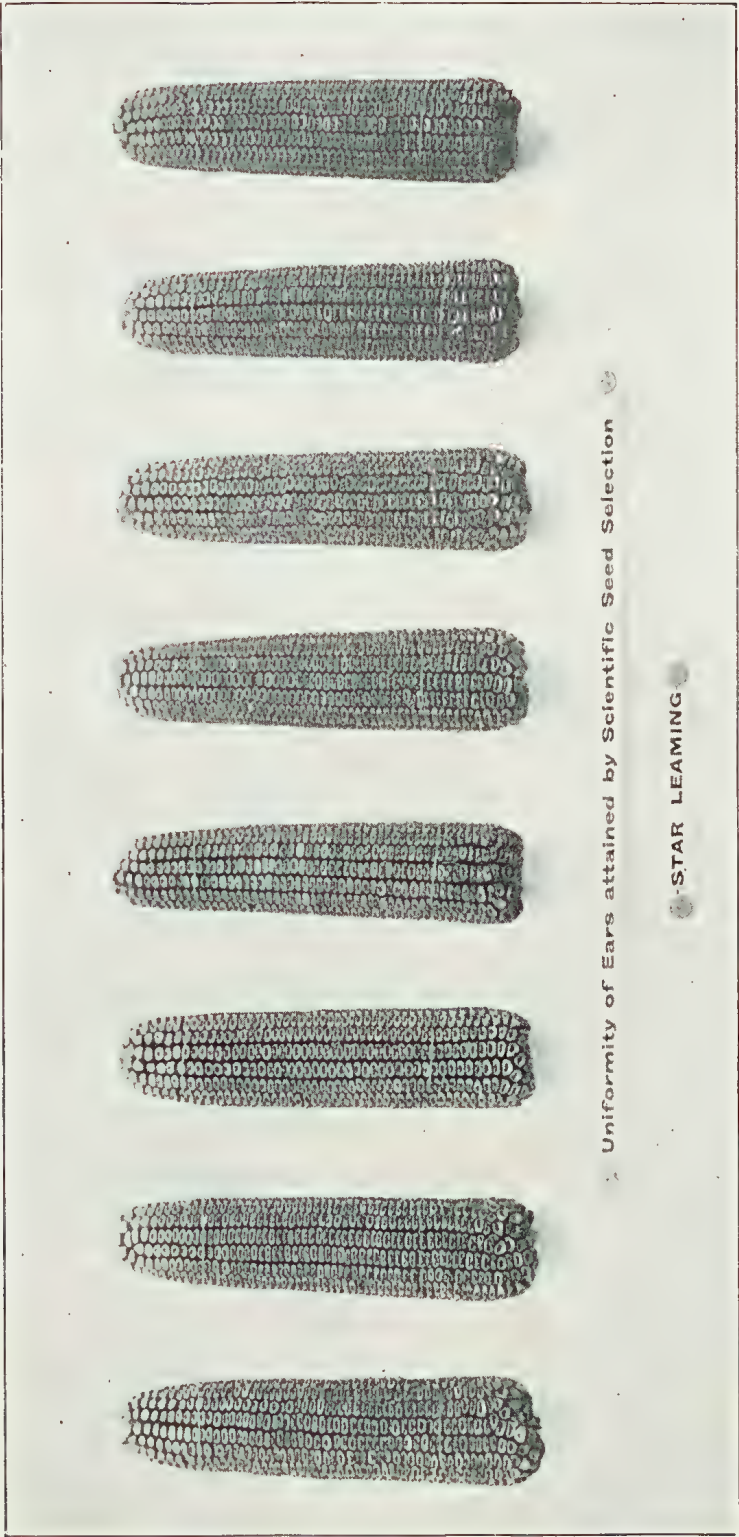


PLATE 86.

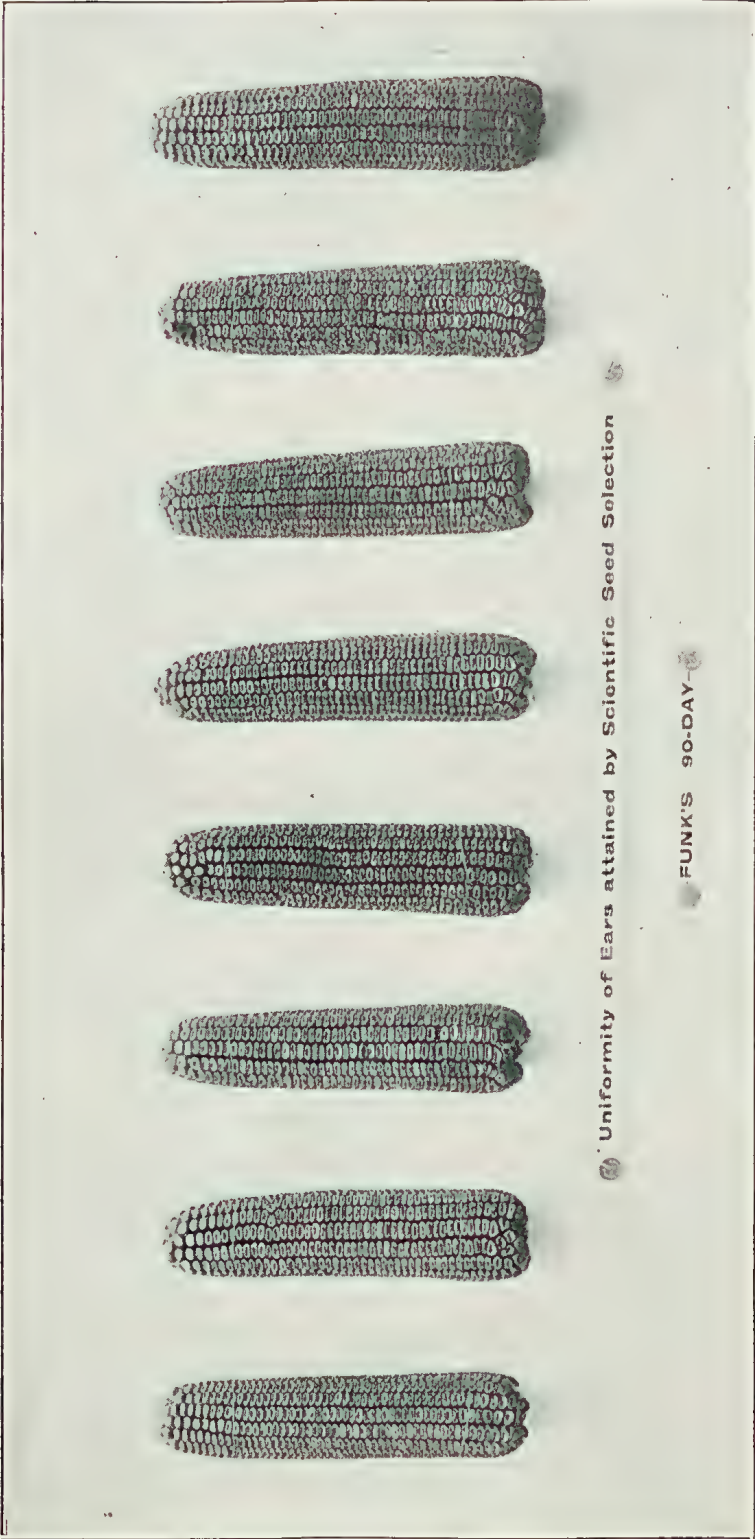


PLATE 87.

OUR FEATHERED FRIENDS.

BIRDS IN RELATION TO AGRICULTURE.

By J. R. KINGHORN, C.M.Z.S.*

That birds are one of man's most valuable and yet least valued possessions is a fact which is recognised by the comparatively few people who study them. Man generally considers himself to be the lord of the earth, but in this he certainly makes a very big mistake, for insects are the dominant power. Whilst a number are beneficial, many are carriers of diseases which affect him either directly or through his products, and as others destroy his works, it will be realised that they are his greatest enemy. There are many scientists who are working untiringly in an endeavour to find some reliable mechanical or chemical insect exterminator; but, while we wait for such an invention to be perfected, we are apt to overlook the fact that certain species of birds will do the work thoroughly if we give them the chance by encouraging them.

Birds, because of their insectivorous diet, form the greatest army that Nature can muster in her endeavour to keep insects from becoming plagues. At times, when the balance of Nature is temporarily upset, insect plagues may eventuate, and then birds and man become allies in the great fight against them. Unfortunately, man soon forgets the work the birds have done for him, and he fails to give them the protection necessary for their welfare and his own.

Economic Value of Native Birds.

Australia is blessed with over 800 species of birds, and only about thirty or forty might be considered to be in some way or other destructive; nevertheless, I would like to add that all of our birds have some economic value. Among our smaller and better known feathered friends are willy wagtails, blue wrens, tomtits, jacky winters, yellow robins, wood swallows, and thickheads, the latter are sometimes known in the western districts of New South Wales as thrushes. All these are most valuable in the garden, the orchard, or the open forest, where they wage continual war on the smaller insects, many of which are highly destructive to man.

The quail is one of our game birds, and, therefore, a reserve food supply, but it is also a great weed and insect destroyer, and, contrary to popular ideas, grain is seldom eaten by them. In California it has been estimated, on examination of stomach contents, that one quail eats half an ounce of seed and half an ounce of insect diet per day; this does not sound very much, but it means that 100 quail in any district would destroy nearly 600 lb. of insects and 600 lb. of weed seeds during the open season, say March to July. In Australia, there is much controversy as to what constitutes the food of the stubble quail; zoologists and the more reliable observers assert that it eats insects and weed seed, and very occasionally fallen grain; while many sportsmen and shooters declare that it is destructive, and eats more grain than seed, with an occasional insect, the latter more by accident than by choice. We must remember that quail are ground birds and can eat only fallen grain, during or after harvesting—a very short season indeed. The rest of the year it must find other food. I have lately examined the stomachs of over twenty stubble quail from grass, lucerne, and stubble land, and found that the crops and stomachs contained grasshoppers, other insects, weed and thistle seed with an occasional grass seed—and, to my astonishment, no grain whatever.

The blue crane is a destroyer of grasshoppers and crayfish (yabbies), which have the habit of boring into the banks of irrigation canals; and ducks are of value because of the great number of water insects which they eat, among which are millions of mosquito larvae.

Rosellas and white cockatoos are known to be highly destructive, yet even these birds can do some good when they turn their attention to weed and thistle seeds. The black cockatoo, on the other hand, having an entirely insectivorous diet, is most useful in the forest areas, where it wages war on the many beetles and borers which would otherwise destroy most of our timber.

The peewee and magpie are two of the most valuable ground feeding birds we have, and they are a great asset to the farmer, inasmuch as they have a special liking for wire-worms and cut worms, which, if left alone, would multiply to such enormous numbers that crops would be absolutely destroyed, and even grass or weeds would not be able to grow.

* In the "Australian Museum Magazine."

The silver-eye is insectivorous as well as frugivorous. There is no doubt that it plays havoc with fruit, but, during the season when fruit is not available, it lives entirely upon insects. It is really a valuable bird in the garden, field, and forest, where it destroys myriads of aphids, scale, and other such pests; but in fruit districts it is valuable only during the season when the bloom is on the trees. The cuckoos and cuckoo shrikes are entirely insectivorous, and therefore deserve full protection for the valuable services they render.

Starlings and sparrows are noted for the damage they do in this country. They not only destroy fruit and grain, but drive away many of our useful insectivorous birds. Individually both birds have many good points, especially the starling, as it often turns its attention to root worms, and it is only when it moves about in large flocks that it becomes destructive. Swallows have been described as the light cavalry of the bird army, but I should prefer to call them the air force. They work continually from dawn to dark, ever on the move, missing no opportunity to destroy insect enemies which have been driven out of the scrub lands by other birds. They are the natural enemy of the weevil, and should be encouraged to live about the farm in large numbers.

Crows and ravens, although undoubtedly destructive in sheep country, have much to be said in their favour. They are great scavengers, being carrion eaters, and therefore destroy possible breeding grounds for that enemy of the sheep-man, the blowfly. They do both harm and good, and should not be killed through prejudice, but should be carefully observed and protected or destroyed as necessary in the districts in which they abound.

The Call for Bird Protection.

The same remarks might apply to the hawks and eagles. Because one may steal a chicken once or twice in its lifetime, the whole family is forever condemned. The natural food of hawks comprises rats, mice, young rabbits, and birds; seldom do they attack man's property, yet they are continually persecuted. Some friends of mine informed me that they had shot 200 eagles on their property in a year because they carried off fowls and lambs. I pointed out that one fowl was a small feed for one eagle, and that it would take well over 30,000 fowls or 5,000 lambs to feed 200 hundred eagles for a year; but, as only a comparatively few lambs and fowls had disappeared, the eagles must have been playing havoc with the rabbits and hares. Eagles live and thrive in mountainous districts where fowls and lambs are quite unknown, and they should receive the same consideration as crows and ravens, though it must be admitted that they are far worse than hawks, many of which are highly beneficial. A leading American biologist has said that "the people who are only too ready to cry out for the destruction of these valuable birds should be the first to ask for their protection."

While most birds work by day, there are also many which hunt at night, foremost among them being the owls, a family comprising many species, all of which are very destructive to mice, which would otherwise overrun the fields. An Australian zoologist, Mr. A. M. Lea, carried out some investigations relating to the food of the barn owl. He estimated that two pellets were thrown up each day, equalling 730 per year; he therefore examined 730 pellets from one locality and found that they contained remains of 1,407 mice, 143 rats, 5 rabbits, 375 sparrows, 23 starlings, 25 other birds, 4 lizards, 174 frogs, 23 night moths, 50 crickets, and 29 other insects. This will afford the reader some idea as to the value of these birds.

The podargus, or frogmouth (perhaps more generally known as the morepork), is insectivorous, and, being a nocturnal bird, it carries on the work started in the daytime by the diurnal birds, mainly against cicadas and night-flying moths.

Wood swallows or blue martins, by reason of their gregarious habits, are highly useful in helping to check plagues. I recollect a plague of caterpillars which visited Bathurst about 1903, attracting thousands of wood swallows, which quickly checked it. As a caterpillar eats about twice its weight in food per day, an army of them would in a short time destroy hundreds, or even thousands, of acres of grass lands and vegetable gardens.

It is at such times that Nature kindly takes a hand and sends the birds to our aid, but we are often only too ready to sit back and let "our feathered friends" do all the work. In respect to the protection of birds, I might say that we owe the main features of our Birds and Animals Protection Act to scientists and naturalists who knew the great value of our fauna, and it was passed by the Government in the interests of the country. Unfortunately—and mainly through ignorance—many people do not respect the clauses of the Act. Birds are ruthlessly slaughtered, their eggs collected, and their breeding interfered with. If half the energy that is expended

in collecting the eggs of protected birds were devoted to collecting the eggs of sparrows and starlings, it should only be a matter of a few seasons before a very appreciable reduction in the numbers of these pests would result and incalculable benefit to the country would follow.

Children who want to study Nature spoil their efforts and good intention by collecting eggs. The notebook and the camera are not only the most interesting but the most instructive and useful articles through which a full insight into the life and habits of birds can be gained.

Nature's Delicate Balance.

We must remember that Nature is wonderfully and delicately balanced. If we reduce her numbers in one direction, the inevitable result will be increased multiplication in another. Thus if we continue to destroy our valuable insect-eating birds, we must be prepared to bear the brunt of attacks of hordes of insect pests, with disastrous results to ourselves. We must not allow ourselves to be carried away by sentiment or prejudice, but must be guided by facts which are the result of scientific investigation.

Birds a National Asset.

We have no right to act selfishly in faunal matters, as the fauna does not belong to us individually or collectively; it belongs to the country. Our Australian birds are both beautiful and useful. They are the greatest national assets which our country possesses, a fact which is only too often overlooked. Birds and other animals are here for our enjoyment and use, but we are apt to forget that we hold them in trust, and should consider them a heritage to be handed down to future generations. If some people persist in destroying as they do now, our fauna is doomed to extinction, and there will come a day when many of our most valuable species will be exterminated. Then our folly will rebound with terrific force, having such terrible results as may end in widespread disaster. The agriculturist and other primary producers would find their work impossible without the aid of birds; so let us protect and encourage them; they are our true friends and allies.

"RUST SCAB" OR "RUST" IN BANANAS.

In the course of a recent reply to a correspondent on the subject of the disease or defect of the banana fruit known as "Rust Scab" or "Rust," the Government Entomologist, Mr. Henry Tryon, made the following observations:—

"It is a banana affection that, for the last twenty years or more, has been observed in banana plantations from Cairns—and beyond—in the north to the Northern Rivers of New South Wales, but by no means generally so.

"Dr. W. A. Cobb, the former well-known Pathologist of New South Wales, fully treats of it in one of his 'Letters on the Diseases of Plants,' second series, 'Agricultural Gazette,' New South Wales, XIV., 3rd August, p. 683-691, 1904. However, he concluded that it was occasioned by a parasitic fungus, not of the nature of any Rust fungus (*Puccinia*) but by one having some of the characters of a yeast organism. He termed the disease 'Banana Scab.' His material, furnished by Cairns, was fruit forwarded to Sydney therefrom.

"About the same time the present writer, on conducting researches into banana troubles in this district, and Cairns also, concluded that Cobb's 'Banana Scab' was of quite a different origin and due to a minute almost invisibly small insect, one of the 'Thrips tribe'—a species of *Euthrips*, and this finding has been accepted by all subsequent inquirers, including Mr. Benson.

"The insect occurs upon the plant in three distinct forms:—(1) The egg, (2) wingless larvæ—of three or more stages of growth, and (3) winged insects—both male and female. As in the case of the majority of other kinds of Thrips their wings are narrow, long, and fringed ('Fringe Wings' or *Thysanoptera*).

"The injurious relationship to the plant—the banana that it affects—arises from two features that are very important to bear in mind.

"One of these consists in the fact that in feeding it probes the cuticle or skin of the banana (any part of the plant and not the fruit only) with its sharp lance-like mouth-organs and thus absorbs the sap, and probably also it gives rise to chemical changes. Hence it cannot be poisoned—say by the use of any arsenical preparation.

"The other feature is that of inserting its eggs, here and there singly just under the cuticle or skin, also cutting for this purpose a minute slit by aid of two saw-edged plates that, arising towards the extremity of the hind body beneath, are, when at rest, unsheathed in a groove, that occurs here directed backwards.

"There are, however, other habits displayed by this Rust Thrips insect that the banana-grower cannot afford to ignore.

"(1) It is very necessary for him to bear always in mind that this tiny insect causing the trouble is, when occurring, present on the plant, before this is indicated by any outward symptoms whatsoever.

"The Rust, so called, is an after effect of injury—first the skin being darkened by chemical change, wherever pricks or slits have been made in egg-laying or feeding, and local death of the epidermis following this, fissuring of the surface taking place, since this cannot expand in correspondence with the plant's growth. It follows from this, that whatever procedures be adopted for controlling the insect, and so preventing its injuries, they must be resorted to earlier than when these signs of the trouble become manifest or manifest to any extent.

"(2) Also that it is present on the plant generally and not on the fruit only, and that therefore as long as any tender skin in the immature fruit is present, it is liable to attack, notwithstanding that the Thrips insects formerly present on the bunch have been killed by some application or another. It may 'come again,' in fact under these circumstances, as banana-growers often have remarked.

"(3) This renewed attack may be derived from eggs inserted singly in the surface tissue of the plant, and that owing to a protective covering of a gum-like nature, that fills the mouth of the egg slits, are almost invulnerable.

"(4) Or it may be due to insects deeply concealed with 'peepers,' within 'suckers,' or within folded 'sword leaves,' or beneath 'leaf sheaths,' as well as in other crannies in the later growths.

"The minute size of the insect favours its habits of entering within these narrow and confined spaces between one part of the plant and another, and when once living in such situations, insecticides can scarcely be forced into them to kill them.

"(5) It must be again borne in mind that both adult male and female insects, as we have already stated, are ultimately winged, and so may pass from plant to plant in flight through the air.

"(6) Again, the intimate relation between the plant and insect, above alluded to, lends itself to the insect's ready conveyance by suckers delivered from infested areas.

"Two noteworthy instances of this have come under my notice. In one case after I had called attention to the imminent risk of introducing the pest by drawing supplies of suckers from a rust-affected district, a grower in a clean area (remote), to whom my warning came too late, thus wholly infested a plantation of 8 acres.

Remedies.

"Various remedial procedures—principally as the outcome of Mr. A. H. Benson's advocacy—and lately so, the use that Pyrethrum and wood ashes have been prosecuted elsewhere for controlling the Rust Thrips and Rust disease. Indeed, he has cited successful experience in dealing with it where referred to, by means of this mixture, applied by a special method that he describes. This I need not enlarge upon since he has told you all through the Press, 'The experience of Fiji,' also Samoa, where the disease is prevalent, is that the powder so applied destroys the 'Thrips'—he states. I have not been fortunate enough to have seen any account of its use for the purpose in these countries, nor am I aware of any evidence derived from well conceived field tests as to its efficiency in controlling the insect's occurrence and the injury for which it is responsible generally. My colleague, however, speaks with special authority and should be better informed.

"*But I still consider that the need for properly designed and properly carried out experimental inquiry is existent.*

"Other contact insecticides, besides Pyrethrum, might be mentioned, but we have not the exact data to recommend resort to them.

"Possibly local inquiry—unfortunately, my ill health will not admit of my personally conducting it—might establish the fact (let us hope so), that the occurrence of Banana Rust or Rust Scab is—in the fertile Gympie area—quite local and circumscribed.

"If it be the case, it might be expedient to consider whether it might not be worth while to eradicate and burn the affected plants—winter favours the effectual carrying out of this procedure—providing a sum of money to compensate those immediately effected by this drastic action."

MOUNT GRAVATT EGG-LAYING COMPETITION.**REPORT FOR MONTH OF SEPTEMBER.**

During the past month 5,802 eggs were laid, equalling an average of 21.49 eggs per bird. This shows a slight falling off from August laying, which would be accounted for by the changeable weather and broody hens. Mr. Hutton's B bird has made an unbroken sequence of 64 eggs.

The weighing of the eggs has been completed, and the scores marked U are those of pens which failed to obtain the average of 24 oz. to the dozen.

The following are the individual records:—

SECTION 1.**LIGHT BREEDS.**

Name.	Breed.	A.	B.	C.	D.	E.	F.	Total for Month.	Grand Total.
D. and G. D. Hindes	White Leghorns	130	136	124	133	131	116	154	770U
D. H. Flowers	Do.	86	100	130	119	135	130	140	700U
Oakleigh P. Farm	Do.	103	129	109	107	123	123	130	694
H. Fraser	Do.	129	111	107	134	101	108	142	690
John J. McLachlan	Do.	49	125	129	95	110	81	129	687
S. Grenier	Do.	97	103	127	112	108	113	144	672
H. T. Britten	Do.	123	127	87	105	46	105	121	671U
Mrs. L. Anderson	Do.	115	108	115	106	110	114	138	668U
T. H. Craig	Do.	106	110	106	120	83	130	152	655
J. E. G. Purnell	Do.	107	95	103	113	116	121	128	655
R. C. J. Turner	Do.	122	121	91	113	81	127	147	655
Kidd Bros.	Do.	122	129	74	119	103	105	132	652
T. D. Honeywill	Do.	111	128	100	103	115	88	134	645
Mrs. R. E. Hodge	Do.	120	115	87	120	105	97	128	644
G. D. Cox	Do.	108	86	123	80	133	110	143	640
A. A. Stirling	Anconas	100	109	125	111	84	105	108	634U
G. Marks	White Leghorns	136	100	100	90	100	102	148	628
W. D. Melrose	Do.	72	112	133	120	85	88	96	628U
W. Wakefield	Do.	43	116	117	99	115	130	148	620
A. Neil	Do.	119	111	106	113	58	95	123	602U
L. G. Selman	Do.	115	112	103	87	98	80	128	595
T. W. Biddulph	Do.	125	114	60	100	77	96	109	572
B. Driver	Do.	90	79	74	128	109	89	138	569
H. P. Clarke	Do.	85	85	98	109	99	80	120	554
W. McHardie	Anconas	98	92	77	96	94	93	124	550
J. D. Newton	White Leghorns	102	87	84	81	102	91	133	547
Chris. A. Goos	Do.	5	125	90	101	110	106	85	537U
Geo. Williams	Do.	104	40	95	94	94	82	120	509
L. Bird	Do.	116	122	107	59	120	110	120	634U
Ancona Club (Pen 2)	Do.	89	88	54	63	80	73	97	447
Ancona Club (Pen 1)	Do.	60	89	85	108	64	17	73	423

SECTION 2.**HEAVY BREEDS.**

James Hutton	Black Orpingtons	124	153	132	110	122	124	156	765
J. Potter	Do.	126	137	110	102	134	101	143	710U
E. Walters	Do.	64	79	96	145	151	112	138	652
D. and G. W. Hindes	Do.	95	89	107	109	136	94	114	630U
R. Burns	Do.	110	100	102	101	91	103	149	607
Kidd Bros.	Do.	98	81	105	105	123	90	134	602
Mrs. A. E. Gallagher	Do.	84	121	101	93	97	93	152	589
F. W. Lenny	Do.	114	67	121	74	70	106	122	552U
H. G. Stevens	Do.	94	104	82	92	80	98	148	550
Mrs. A. Kent	Do.	106	123	65	73	69	98	133	534
H. M. Challie	Do.	86	99	105	86	122	34	105	532U
J. Ferguson	Do.	42	85	110	99	84	98	119	518
E. C. Stead	Wyandottes	41	109	53	79	55	80	142	423U
Carinya Poultry Farm	Black Orpingtons	103	82	122	113	108	122	133	650U

N.U.P.B.A., TOOWOOMBA SUB-BRANCH.

Single Test Egg-laying Competition—Scores to 31st August, 1924.

BLACK ORPINGTONS.

Pen No.	Name.	Weight of Eggs.	Total for Month.	Total to Date.
2	Hutton, J.	2.10	22	122
11	Webb, A. W.	2.30	26	117
52	Holmes, R.	2.16	21	117
9	Everlay P. Farm	2.22	26	116
29	Adams, W. S.	1.83	15	113
28	Williams, W. D.	2.21	21	111
51	Holmes, R.	1.95	22	111
45	Stephens, H. B.	2.16	27	110
24	Carr, T. J.	1.77	24	110
22	Walsh, H.	1.96	26	110
33	Potter, J.	2.02	24	109
42	Wilson, W. K.	2.01	23	108
7	Adams, P. F.	1.68	29	106
20	Maund, Mrs. L.	2.11	24	106
23	Carr, T. J.	2.07	25	106
42	Wilson, W. R.	2.01	23	108
5	Walters, E.	2.21	24	101
49	Ollier, T. C.	1.70	22	101
15	Macfarlane, K.	2.18	26	100
40	Rodgers, G. E.	2.16	22	100
32	Radford, G.	2.00	22	96
3	McLay, J. A.	2.26	23	95
10	Everlay P. Farm	2.22	26	95
43	Smith, E. R.	2.21	22	95
39	Rodgers, G. E.	2.18	23	93
50	Ollier, T. C.	2.00	27	91
13	Burns, R.	2.05	28	90
31	Radford, G.	1.96	15	90
19	Maund, Mrs. L.	2.03	23	88
6	Walters, E.	2.26	24	86
25	Stephens, Moss	2.03	26	86
1	Hutton, J.	2.16	12	83
44	Smith, E. R.	2.33	24	83
27	Williams, W. D.	2.13	20	82
30	Adams, W. S.	2.07	27	81
36	Rivett, R. R.	2.20	21	80
21	Walsh, H.	2.17	12	79
37	Short, J. W.	2.02	18	77
48	Head, J.	2.03	24	70
16	Macfarlane, K.	1.77	22	65
14	Burns, R.	2.03	21	62
46	Stephens, H. B.	2.42	20	61
47	Head, J.	1.80	24	61
34	Potter, J.	1.67	22	59
35	Rivett, R. R.	2.00	14	53
4	McLay, J. A.	2.11	16	51
8	Adams, P. F.	2.07	26	50
38	Short, J. W.	1.97	28	49
26	Stephens, Moss	2.37	21	47
17	Champion, S. H. K.	1.94	6	39
18	Do.	2.02	22	39
12	Webb, A. W.	—	—	16

OTHER VARIETIES.

60	Le Pla, A. W. (R. I. Reds)	2.02	26	118
70	Dibbs, H. (Langshans)	1.96	25	113
59	Le Pla, A. W. (R. I. Reds)	2.08	19	109
53	Warrian, C. G. (Rock.)	1.98	25	108
66	Becker, W. (Langshans)	1.57	27	107
57	Maund, Mrs. L. (Col W'dotte)	1.88	25	97
65	Becker, W. (Langshans)	1.84	24	90
61	Harrington, J. (B. Leghorns)	2.00	17	88

OTHER VARIETIES—*continued.*

Pen No.	Name.	Weight of Eggs.	Total for Month.	Total to Date.
56	Carr, T. J. (S. W'dottes)	1.75	18	83
69	Dibbs, H. (Langshans)	2.17	17	80
68	Everlay P. Farm (B. Leghorns)	1.85	22	79
71	Brand, V. (R. I. Reds)	2.10	17	73
64	Rafter, J. J. (B. Leghorns)	2.06	18	71
54	Warrian, C. G. (Rock.)	2.17	25	70
58	Maund, Mrs. L. (Col. W'dotte)	2.00	18	48
55	Carr, T. J. (S. W'dotte)	1.98	25	44
63	Rafter, J. J. (B. Leghorn)	2.01	16	42
62	Harrington, J. (B. Leghorn)	1.75	12	41
72	Brand, V. (R. I. Red)	2.33	20	41
67	Everlay P. Farm (B. Leghorn)	2.20	20	27

WHITE LEGHORNS.

132	Short, J. W.	1.74	26	129
112	Chapman, S.	1.87	22	117
114	Cole, R. C.	2.30	27	116
131	Short, J. W.	1.87	25	116
105	Hutton, J.	2.05	21	115
78	Howard, R. B.	2.31	27	113
74	Dippel, D. H.	2.10	21	108
110	Emoh Pens	1.89	24	108
124	King, J. E.	2.12	23	108
73	Dippel, D. H.	2.15	23	105
121	Grant, W.	2.00	23	104
106	Hutton, J.	1.85	25	103
111	Chapman, S.	2.11	20	103
91	Stilton, G.	2.06	22	102
122	Grant, W.	2.20	25	102
129	Manning, H. G.	2.17	21	99
123	King, J. E.	2.27	25	98
93	Williams, D. W.	2.00	22	97
103	Fallon, P. J.	1.70	23	93
100	Newton, J. W.	1.89	21	92
118	Goggins, J.	1.98	25	92
115	Taylor, J.	2.31	10	91
113	Cole, R. C.	1.97	21	90
75	Wilson, W.	2.22	21	89
88	Warrian, C. G.	1.87	27	89
109	Emoh Pens	1.92	23	88
101	Turner, R. C. J.	2.22	10	87
108	Adams, P. F.	2.30	20	87
125	Maurer, G.	1.90	25	87
77	Howard, R. B.	2.36	20	86
97	Hunt, G.	2.18	24	84
87	Warrian, C. G.	2.01	23	83
95	Adams, W. S.	2.08	22	83
99	Newton, J. W.	1.91	20	83
117	Goggins, J.	2.08	23	83
85	Rivett, R. R.	2.43	27	82
128	Stilton, E. J.	2.00	22	82
104	Fallon, P. J.	1.83	16	81
86	Rivett, R. R.	2.10	22	80
96	Adams, W. S.	2.08	23	80
116	Taylor, J.	2.12	8	79
76	Wilson, W.	2.16	22	78
81	Smith, E. R.	2.12	24	72
127	Stilton, E. J.	2.07	18	72
107	Adams, P. F.	2.18	22	71
80	McBean, S.	2.09	21	71
120	Rogers, G. E.	2.27	24	69
102	Turner, R. C. J.	2.04	—	68
126	Maurer, G.	1.99	23	67
130	Manning, H. G.	1.76	24	67
83	Carinya P. Farm	2.00	20	66
90	Ellis, L. E.	2.04	18	66

WHITE LEGHORNS—*continued.*

Pen No.	Name.	Weight of Eggs.	Total for Month.	Total to Date.
92	Stilton, G.	2.10 ..	16 ..	66
79	McBean, S.	1.93 ..	24 ..	64
84	Carinya P. Farm	2.04 ..	22 ..	63
119	Rogers, G. E.	1.97 ..	20 ..	60
94	Williams, D. W.	2.26 ..	21 ..	59
89	Ellis, L. E.	2.22 ..	20 ..	57
98	Hunt, G.	2.13 ..	17 ..	46
82	Smith, E. R.	2.00 ..	19 ..	34

AVERAGES.

	Blk. Orp.	Other Var.	W. Leg.	Total.
Total number of eggs laid during month ..	1,136	417	1,273	2,826
Average per bird	21.85	20.85	21.21	21.41
Total eggs laid to date	4,472	1,579	5,130	11,181
Average per bird per month for 5 months	17.2	15.8	17.1	16.94

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF AUGUST, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING AUGUST, 1924 AND 1923, FOR COMPARISON.

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	Aug.	No. of Years' Records.	Aug., 1924.	Aug., 1923.		Aug.	No. of Years' Records.	Aug., 1924.	Aug., 1923.
<i>North Coast.</i>	In.		In.	In.	<i>South Coast—continued:</i>	In.		In.	In.
Atherton	0.83	23	0.93	0.20	Nambour	1.97	28	1.74	1.29
Cairns	1.76	42	3.16	0.76	Nanango	1.42	42	1.00	0.56
Cardwell	1.32	52	1.94	1.21	Rockhampton ...	1.03	37	0.71	0.21
Cooktown	1.34	48	1.40	0.14	Woodford	1.84	37	1.19	0.90
Herberton	0.67	37	1.09	0.25					
Ingham	1.42	32	5.60	2.20	<i>Darling Downs.</i>				
Innisfail	5.24	43	5.32	3.71	Dalby	1.23	54	1.77	0.35
Mossman	1.33	15	6.57	0.28	Emu Vale	1.19	28	1.85	0.85
Townsville	0.49	53	2.68	1.69	Jimbour	1.28	36	0.88	0.30
<i>Central Coast.</i>					Miles	1.19	39	0.76	0.33
Ayr	0.56	37	4.07	1.02	Stanthorpe	1.82	51	1.86	0.25
Bowen	0.70	53	0.90	0.51	Tecowoomba ...	1.75	52	1.39	0.59
Charters Towers ...	0.54	42	3.71	1.12	Warwick	1.55	59	1.72	1.68
Mackay	1.06	53	0.56	1.23					
Proserpine	1.36	21	3.36	1.36	<i>Maranoa.</i>				
St. Lawrence	0.91	53	0.66	0.88	Roma	0.95	50	3.80	0.02
<i>South Coast.</i>									
Biggenden	1.16	25	0.65	0.15	<i>State Farms, &c.</i>				
Bundaberg	1.38	41	0.50	0.80	Bungeworogorai ...	0.80	10	3.91	0.01
Brisbane	2.11	73	1.35	0.70	Gatton College ...	1.17	25	1.75	0.39
Childers	1.29	29	1.48	0.26	Gindie	0.82	25	0.70	1.67
Crohamhurst	2.32	30	1.86	1.35	Hermitage	1.36	18	1.99	0.55
Esk	1.56	37	1.91	0.41	Kairi	1.02	10	...	0.48
Gayndah	1.23	53	1.27	0.32	Sugar Experiment Station, Mackay	0.95	27	0.46	0.90
Gympie	1.84	54	1.29	0.83	Warren	1.00	10	0.44	0.12
Glasshouse Mts. ...	1.58	16	...	1.18					
Kilkivan	1.55	45	0.81	0.37					
Maryborough	1.75	53	1.62	0.76					

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for August, 1924, and for the same period of 1923, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND, State Meteorologist.

PROGRESS IN THE FAR NORTH.

ATHERTON TABLELAND AND DAINTREE RIVER.

The Minister for Agriculture and Stock (Hon. W. N. Gillies) has made available the following report (29th September, 1924) by Mr. C. McGrath, Instructor in Dairying, on his recent visit to the Atherton Tableland and the Daintree River.

Bushy Creek.

This district has made decided progress during the past two years. A large area of scrub has been felled, burnt off, and grassed. The grasses favoured are *Panicum muticum* for the creek flats and *paspalum* for the slopes and ridges. The *Panicum muticum* grows luxuriantly on the flats, and when established safely pastures one to one and a-half beasts to an acre.

The stock were looking well, and it was pleasing to find that the dairy farmers are introducing pure-bred sires to head their herds.

The butter factory is centrally situated and adjacent to the partly constructed railway line. The factory is not yet fully equipped. A refrigerator of 8 tons capacity has been secured and is about to be installed. The output, which is marketed locally, is about 7 to 8 cwt. weekly.

About twelve suppliers are on the factory's books and others are engaged in preparing their land for farming and securing dairy stock. Through the decline in mining and the removal of the greater part of the millable timber, the district received a serious setback.

The establishment of the dairy factory at Bushy Creek and a modern bacon factory near Mareeba assures the successful settlement of this district.

Daintree River.

This district has made rapid progress since my previous visit some two years ago. The opinion then formed as to the suitability of the district for dairying is confirmed by the occupation of areas by experienced dairy farmers and the results obtained by them.

The rich scrub flats of the Daintree and its tributaries, when put under *Panicum muticum* grass, provide a luxurious growth of grasses and will carry two beasts to an acre. On the cleared slopes and ridges *paspalum* grass grows luxuriantly. Some 600 head of dairy cattle have been introduced to this district during the past two years, and further numbers are arriving as settlers fall, burn, and grass their holdings. This work is proceeding rapidly; some 3,000 acres are at present grassed with *Panicum muticum* and *Paspalum dilatatum*.

In visiting the dairy farmers I noticed that the improvements carried out and under construction were of a substantial nature and up to date. Three commodious milking sheds, to be equipped with milking machine plants, were nearing completion.

The dairy stock are being drawn chiefly from herds on the Atherton Tableland. Pure-bred dairy sires are being introduced, and the importance of breeding from pure-bred sires from good producing strains was stressed.

The dairy cows in profit are giving very satisfactory returns. The dairy stock were in excellent condition. The young stock are exceptionally well-grown. Milking Shorthorns and Jerseys are the sires chiefly used.

The season has been favourable and the pastures are excellent. The country is well watered by creeks and springs.

As the country is being opened up and ridges cleared, sites very suitable for residences and farm buildings are appealing to the settlers, and several new home-stands overlook the rich pastures of the river flats.

The dairy factory is located on a hill at the junction of the Daintree River and Stewart's Creek. The cream is conveyed to the factory in boats. The Daintree and its tributaries, including the Stewart and the Douglas Creeks, are more or less navigable for boats—a decided advantage.

The butter factory is well laid out and substantially constructed, and is furnished with modern equipment, including a batch pasteuriser. The location of the factory allowed for the adoption of the gravitation principle, and cream pumps are dispensed with. The factory has been constructed so as to allow for the installing of necessary additional plant to cope with increasing supplies. The building will house a plant

capable of treating a supply of 20 tons of butter per week. The output is some 8 to 9 cwt. per week, and will increase quickly as dairy cattle in or near profit are being brought up to the district. The output finds a ready local market in the Messman and Port Douglas areas.

Atherton Tableland.

The following centres on the Tableland were visited:—Mareeba, Atherton, Yungaburra, Malanda, Millaa Millaa, Ravenshoe, Glen Alwyn, and Kairi.

An adverse season was experienced on the Tableland last year, the rainfall being much below average. The present season is, however, most promising, as splendid rain fell in July and August, ensuring an early spring and good growth of herbage and crops. This season's prospects for dairymen are very bright.

The maize crop is generally satisfactory, and marketing is under the control of the North Queensland Maize Pool Board.

The erection of silos at Kairi and Tolga, and a drying plant and silo at Atherton, enables the pool management to handle the season's crop expeditiously, as the storing capacity of the silos is about 6,500 tons. The bulk of the present maize crop was planted late on account of adverse weather conditions.

The silos at Atherton are receiving maize, which is cleaned and graded. This plant was doing its work very effectively, and all dust, dirt, and particles of cob are removed and a clean well-graded sample is delivered. It is a modern business-like method of handling this crop, and enables the producer to safely store his produce and place it regularly on the market, and so avoid creating gluts and low prices at one period and very often a scarcity and abnormally high prices at another period.

Owing to the diminished supplies of cream coming forward to the Atherton Co-operative Dairy Company's two factories at Golden Grove and Malanda, in consequence of the dryness of last season, the management decided to close the Golden Grove factory and to send all cream supplies to Malanda. The Atherton Co-operative Factory plant at Malanda is to be added to by installing two glass-lined cream-holding vats. By arrangement with the Railway Department the management of the company runs a rail motor to which is attached a trailer for the conveyance of cream to the Malanda factory. This motor runs between Millaa Millaa and Yungaburra to Malanda factory.

It is a satisfactory service and allows of the cream reaching the factory with as little delay as possible. Such a cream delivery service overcomes the disadvantage of farmers having to deliver cream overnight in order to catch an early morning train. The time of departure of the motor from the terminus of its run is arranged so that dairymen can deliver their cream on the rail on the morning the motor runs through to the factory. Such a method of delivery assists materially in improving the quality of the butter produced from such cream. The regular and quick service deliveries of cream to the factory should receive full consideration by all interested in the dairying industry.

Generally the dairymen depend on the pastures of sown grasses, chiefly *Paspalum* and *Panicum muticum*, to provide fodder for their dairy stock the whole year round. A number of dairymen are giving attention to the growing of fodder crops to supplement the permanent pastures. The growing of these crops will become more general as the land is cleared and cultivated.

The establishment of the Atherton Co-operative Bacon Factory at Mareeba opens up for the Tableland a most profitable branch of dairy farming. The Tableland is climatically and agriculturally very suitable for pig raising and fattening. Maize, lucerne, and root crops suitable for pig feeding yield heavily on the Tableland. A rapid expansion of this industry is assured.

The output of the Atherton Co-operative Bacon Factory is highly spoken of and meets with ready sale in Northern markets. The management advise that the demand for their product exceeds the output. An addition to the factory's plant is now being made.

Some good dairy herds are being built up. Pure-bred sires are much in evidence among the herds, and this augurs well for the future improvement of the dairy stock. Cooled milk is being forwarded daily by rail from the Tableland to Mareeba and Cairns to supply the retail trade of those centres. Generally this portion of the State is making satisfactory progress.

The dairying industry will expand more rapidly now that its allied industry, pig raising and fattening, has a bright future assured by the opening of a modern bacon factory on the Tableland.

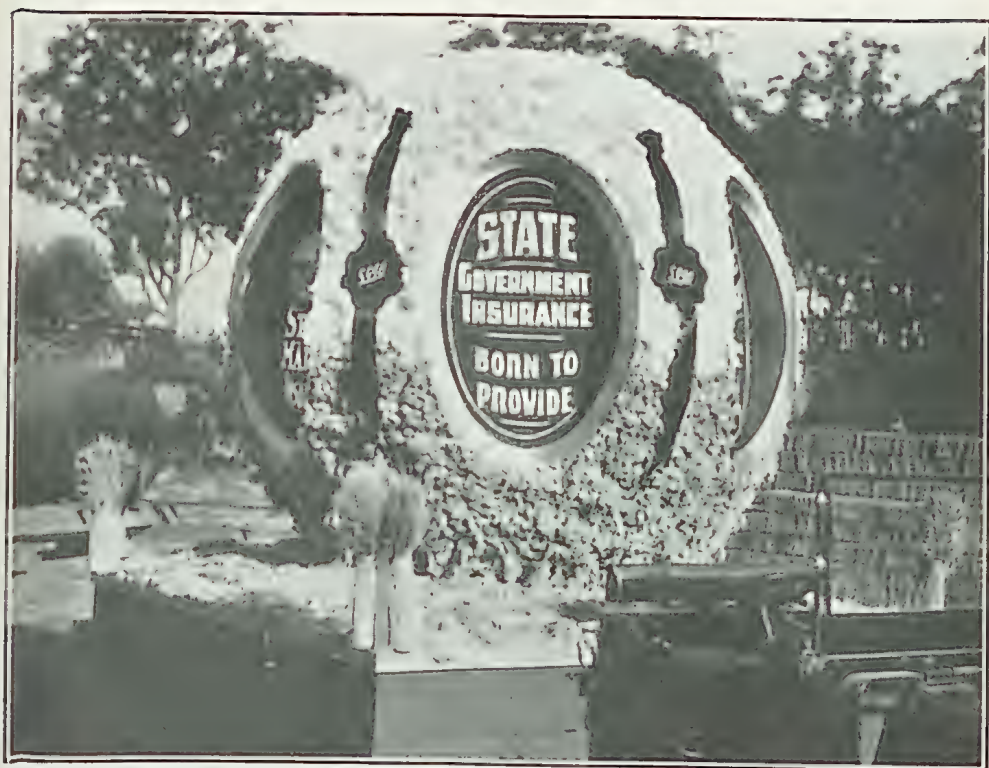


PLATE 88.—QUEENSLAND STATE INSURANCE TROPHIES,
BRISBANE CENTENARY PAGEANT.



PLATE 89.—BANANA BEETLE BORER INVESTIGATIONS.
DEPARTMENTAL RESEARCH WORK ILLUSTRATED AT THE BRISBANE SHOW, 1924.



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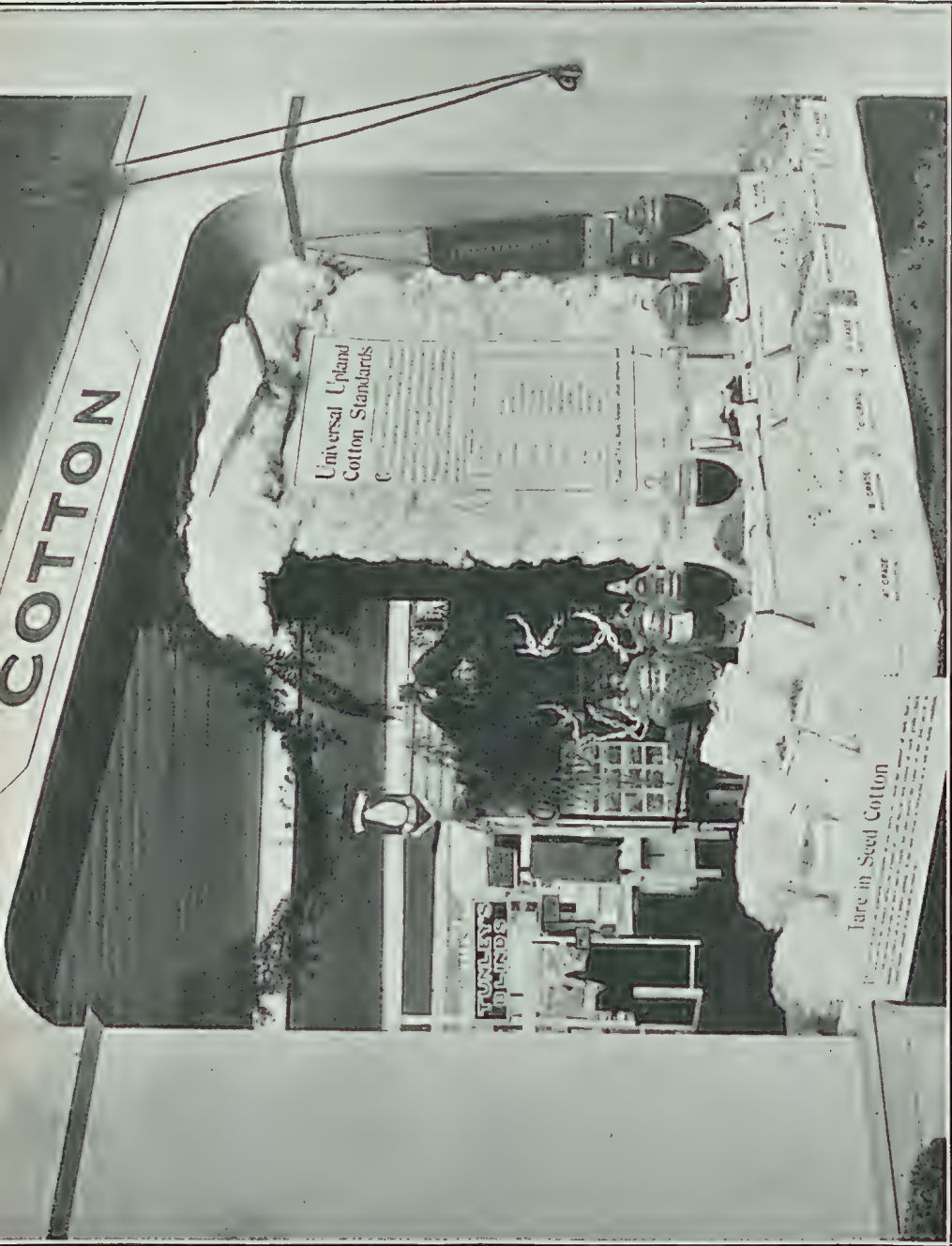


PLATE 91.—COTTON TROPHY, DEPARTMENTAL COURT, BRISBANE SHOW, 1924.



PLATE 92. MR. K. HAAG'S WINNING "ONE-FARM" EXHIBIT, BRISBANE SHOW, 1924.



PLATE 93.—CANE DISPLAY BY BUREAU OF SUGAR EXPERIMENT STATIONS, BRISBANE SHOW, 1924.



PLATE 94.-THE NORTHERN DARLING DOWNS (DALBY DISTRICT) WINNING EXHIBIT - PRIMARY PRODUCTS ONLY -
BRISBANE SHOW, 1924.



PLATE 95.—A FINE GROUP OF AYRSHIRES, BRISBANE SHOW, 1924.



PLATE 96.—JUDGING JERSEYS, BRISBANE SHOW, 1924.



PLATE 97.—JUDGING ILLAWARRAS, BRISBANE SHOW, 1924.



PLATE 98.—PARADE OF GOVERNMENT CLYDESDALES, BRISBANE SHOW, 1924.



PLATE 99.—JUDGING FRIESIANS, BRISBANE SHOW, 1924.



PLATE 100.—JUDGING AYRSHIRES, BRISBANE SHOW, 1924.

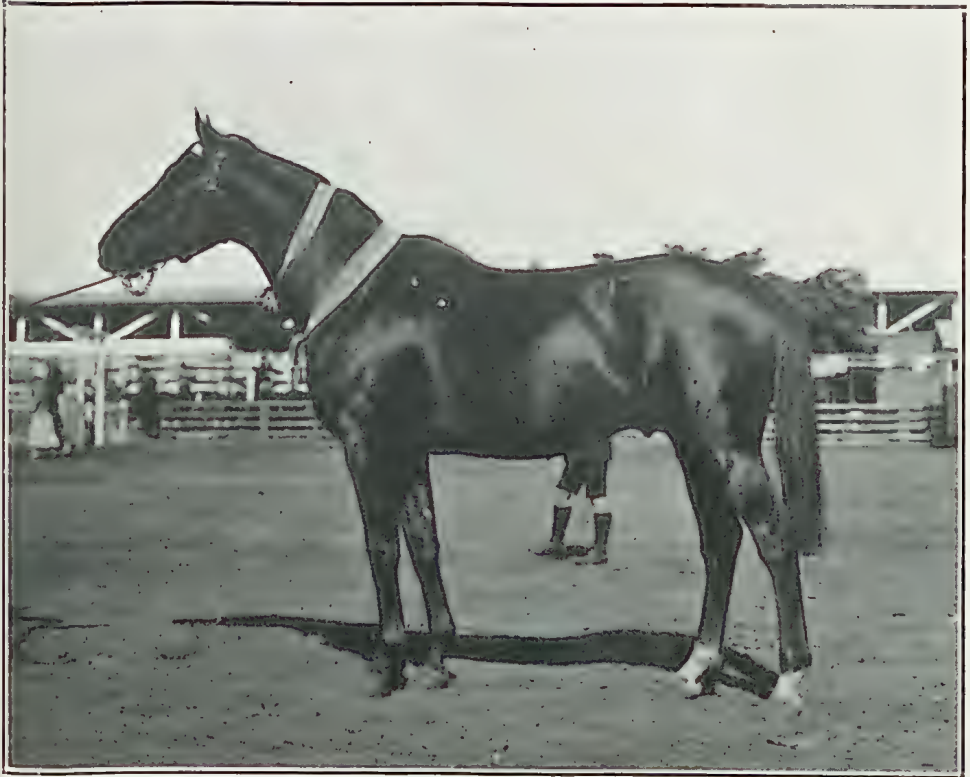


PLATE 101.—CHAMPION BLOOD HORSE, BRISBANE SHOW, 1924..
“Polybius,” the property of Mr. M. F. Yoro.



PLATE 102.—CHAMPION MILCH COW, 1924.
Elsie IV. of Oakdale, the property of Mr. B. O'Connor, Oakvale, Colinton.

POSSIBILITIES OF CAMPHOR CULTIVATION IN QUEENSLAND.

C. T. WHITE, F.L.S., Government Botanist.

The Camphor Laurel (*Cinnamomum camphora*) so common in Queensland gardens and as a street tree is the source of commercial camphor.

The cultivation of the tree, however, is one beset with great difficulty and has been tried with but little success in most tropical countries and of more recent years in the United States. The reason for this is that though practically all the trees produce camphor oil, it is only some of the trees that produce camphor.

Professor E. H. Wilson, who probably has a greater knowledge of the trees of China and Japan than any other man, writes interestingly of the Camphor Laurel. Among other remarks he says:—

“Small quantities of camphor are obtained in South Japan, in Fokien and Kwangtung provinces of China, but the real industry is confined to Formosa. Apparently the climatic conditions there are more favourable to the secretion of the necessary hydro-carbons than elsewhere. It is a curious fact that not every camphor-tree yields camphor in appreciable quantities, neither is every part of the tree equally rich. Often it happens that in two trees growing side by side one may be rich in camphor and the other almost devoid of it. Sometimes it happens that one side of the tree may be richer than the other. Why these marked variations in the quantity should be there is no telling, but the fact remains. Some day it may afford the plant hybridist opportunity to breed a race of camphor-trees all equally rich in camphor. Chinese do most of the work of camphor distilling in the forests of Formosa, and they are expert in telling by means of smell and taste which trees are profitable to work and which are not. The bole of the tree is usually richest and frequently the thick, buttress roots rank next. The work of felling the tree is sometimes done in piecemeal fashion. The wood is reduced to thin chips by means of an adze or gouge-chisel and is then ready for camphor distillation. From the crude stills in the forest the camphor and camphor oil is taken to the factory of the Monopoly Bureau, Taihoku, and refined.

“However, the tree is becoming rare, which should occasion no surprise when it is remembered that its destruction has been in progress since the sixteenth century and with increasing rapidity. Admitting that there are districts in which the camphor-tree grows yet to be exploited, it needs no prophet to foretell a shortage in the near future. The Japanese Government has realised the fact and commenced planting in the northern parts of Formosa on quite a large scale. I saw these plantations and they are thriving, but there will be lean years before they are available as a source of supply.

“There is another fact worthy of record which may have great or may have no effect on the yield from plantation camphor. In Formosa the wild camphor-trees are tall and gathering the fruits has been found to be exceedingly difficult and costly. The Camphor Monopoly Bureau, therefore, has purchased and continues to purchase its stocks of camphor-tree seeds in Japan, where in temple grounds the gathering of the seed is a simple matter. So the situation is that plantation camphor in Formosa, and for that matter everywhere else in the world, is the product of Japanese camphor-trees. Whether trees of this origin will produce camphor in quantity and quality comparable with that of the Formosan trees has yet to be proved.”

It will be seen from the foregoing remarks that if we imported seed from Hong Kong or even from the Forestry Department at Taihoku we would probably only get what we already have in quantity—the seed of the Japanese tree. If the industry is to be started in Queensland as a secondary forests industry, the best method to adopt would be to try a number of the trees already here for camphor and keep seed from those giving the best yield.

QUEENSLAND TREES.

By C. T. WHITE, F.L.S., Government Botanist, and W. D. FRANCIS, Assistant Botanist.

The tree whose stem and foliage specimens are shown in the accompanying photographs, is known at Imbil, on the Mary Valley Line, as White Bark, and in botanical nomenclature as *Endiandra compressa*. Its two most common features are its white bark and its large black or dark-blue fruit containing a large single seed. The fruit as well as the seed are frequently compressed or flattened in a vertical plane. The species is common at Imbil and has been found also on the Blackall Range, near Mapleton and Eumundi.



Photo. by Authors.]

PLATE 103.—ENDIANDRA COMPRESSA.
A tree growing in the Imbil rain forest.



Photo. by Dept. Agriculture and Stock.

PLATE 104.—*ENDIANDRA COMPRESSA*.
Showing leaves, flowers, and a dry fruit.

THE BRITISH LARGE BLACK BREED OF PIG.

E. J. SHELTON, H.D.A., Instructor in Pig Raising.

The British Large Black Pig, also called the Large Black, is another of the old English breeds noted for hardiness and good grazing qualities. Like the large Yorkshires, they are not in general as popular as the Tamworths or the medium breeds (the Berkshire, Middle York, or Poland-China), and the only purpose for which this type can be used in Australia is for cross-breeding with the medium breeds. In this case it is advisable to use sows of this large type and boars of one of the three medium types named above. The sows of this type (*i.e.*, the crossbred sows) mated back to the Berkshire boar will prove excellent mothers.

These lastnamed crosses are really three-quarter pure, *i.e.*, they have two strains of the medium type to one of the large, and are excellent bacon pigs, but in the purebred state the Large Black has proved quite unsuitable to our market requirements, and so long as the demand is for a light to medium weight bacon pig these conditions are not likely to vary much. The reason for this is that the purebred Large Blacks carry a rather heavy percentage of offal; and, being a large fleshy breed, they require comparatively heavy feeding, so that unless supplied with ample nourishment they will not prove satisfactory.

The crossbred pigs provide a lengthy fleshy side of bacon, and when used with the Berkshire or other breeds named, the flesh is much improved in quality. The Berkshire boar crossed on to the Large Black sow can be regarded as an ideal cross. On no account should Tamworth or Large Yorkshire boars be mated with them. One valuable characteristic of the type is their prolificacy and docility, and in general the progeny are sturdy, and grow quickly.

The more recently introduced pigs of this breed (see Figs. 1 to 3) appear to be a great improvement on the types of years ago, and will go a long way towards restoring their one-time popularity here.

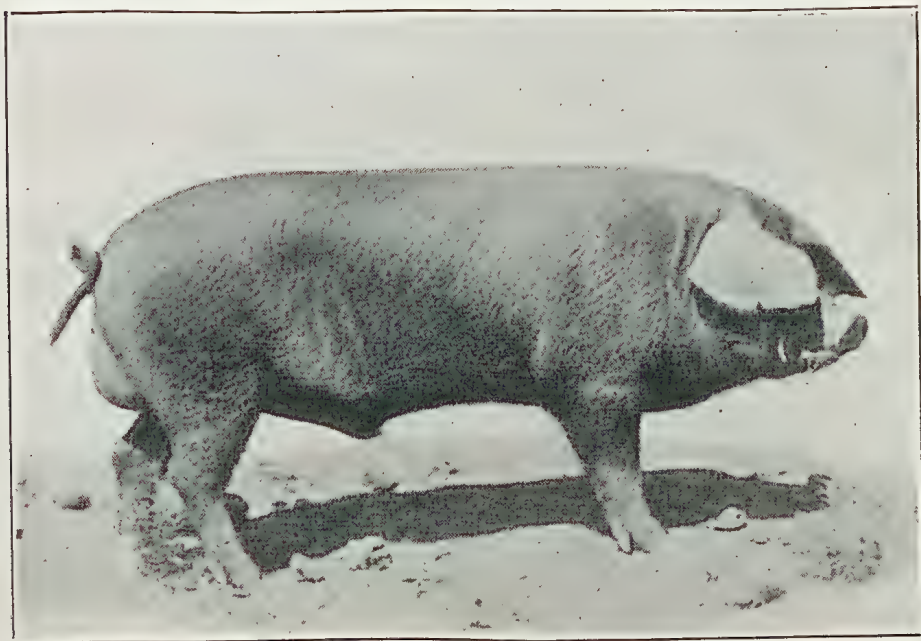


FIG. 1.—“PLAYFORD EROS,” (Reg. No. 26333).

Large Black Boar, imported by Mr. W. Barker, of Bendigo, Victoria.

Note the characteristic type, the length and quality of this animal.

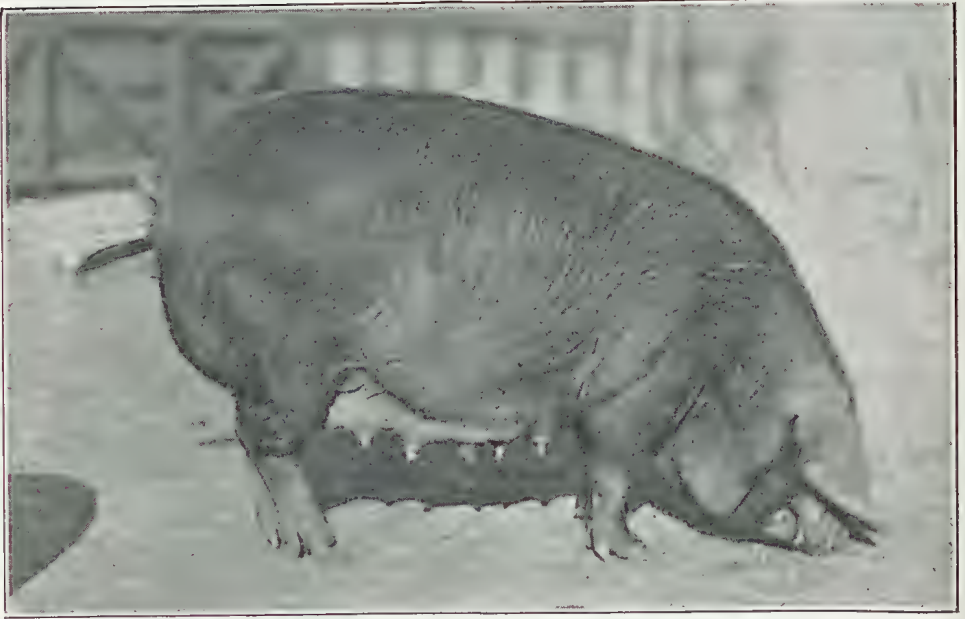


FIG. 2.—“SWARDESTON DEVOTE” (IMP.) No. 25, PROPERTY OF W. E. BARKER, BENDIGO EAST, VICTORIA.

This sow was injured in transit to Australia, hence does not show to advantage. She has a great depth of ham, a deep side, and a well-developed line of teats.



FIG. 3.—“HENHAM QUEEN BESS 5TH,” (IMP.) No. 26, PROPERTY OF W. E. BARKER, BENDIGO EAST, VICTORIA.

This sow has great length of body and is of characteristic type and quality.

A short historical account of the breed proves of interest, and here is what the Large Black Pig Society of England has to say about it:—"The antiquity of the breed is beyond doubt, for there is ample evidence that the Large Black pig, with its characteristic whole colour, its length, fine hair, lopped ears, and great grazing capacity, existed in many parts of the United Kingdom at a date prior to the memory of any of the present generation of breeders. The pig is a native of Cornwall and Devon, and, although it has only been registered in the stud-book of England for twenty-five years, it has come to the front with amazing rapidity, and is now regarded as one of the most prolific and popular of all the British breeds."

The first importation of this breed into Australia was made by Mr. Herbert Garratt, of "Loch Maree," Randwick, New South Wales, in 1904, when he imported a boar and two sows, great prize winners, of good type and quality. These animals formed the nucleus of a successful stud, which at its dispersal was considered one of the best in New South Wales. Owing to business reasons and failing health, Mr. Garratt relinquished pig breeding in 1909, the whole stud being purchased by the New South Wales Government for the Hawkesbury College and Wagga Experiment Farm studs. Mr. Garratt's first importation was so successful that he later imported several other animals of very high quality. He "boosted" the breed, and was largely instrumental in popularising it amongst pig-breeders in New South Wales.

The Crossbred as Bacon Pigs.

With regard to the young pigs from the crosses named, it may be said that they make up into excellent quality bacon pigs, when from five-and-a-half to six or six-and-a-half months old, if intelligently fed. As porkers they are inclined to be too growthy, and do not fatten readily until about five months old. This, of course, is characteristic of the large breeds at all times. The Large Black sows usually develop very large udders and are particularly heavy milkers; in this connection it is interesting to note that this characteristic is hereditary, as is well known with the deep-milking strains of dairy cattle; unfortunately, many of our improved strains of pigs lack the heavier milking capacity. It is absolutely essential that the sow should be able to rear her litter, otherwise the result must always be unsatisfactory. On the English markets, the Large Black breed is evidently more popular as a stud pig than it is in Australia, for at a recent sale of stud stock, some very high prices were obtained for selected boars and sows.

To breeders that fancy this type, but are unable to obtain satisfactory stud animals, the writer's advice is, try the Tamworths, remembering all the time that these large breeds require ample food supplies and constant attention, and are more satisfactory as bacon than as pork pigs.

Fresh Importations.

Up to within recent months it has been almost impossible to secure boars or sows of this breed here, but a fresh importation has recently been made by Mr. W. H. Barker, of California Gully, Bendigo, Victoria, and by his son, Mr. W. E. Barker, of Bendigo East, Victoria. These pigs were selected in England through His Excellency Lord Stradbroke, Governor of Victoria, himself an ardent admirer of the breed as well as a noted breeder of Large Blacks. During his visit to England some time ago he selected for Mr. Barker a number of noted representatives of famous Large Black studs, and this was the principal factor leading up to their introduction into Victoria.

From these importations Mr. Barker has built up his present stud and has quite recently reported sales of these pigs to Western Australia, as well as to New South Wales and some of the dairying districts of Victoria. Mr. Barker's experience of the breed has been summed up in this conclusion:—

The Large Blacks are noted for prolificacy; economical to handle; possess unequalled early-maturing qualities; they are hardy, healthy, and an excellent dual purpose pig; they are docile and even-tempered; they are unsurpassed as graziers.

He states as evidence of the prolificacy of these strains that in one well-known herd of pedigreed pigs four sows farrowed fifty-three young pigs between them; in another case he instanced where a boar of this breed had been turned in with ten breeding sows with a result that at farrowing time ninety-eight young pigs were born.

An illustration of the prolificacy of a young sow on her first litter was also mentioned, the sow giving birth to thirteen pigs. At fifteen months old, of four sows out of a famous prize-winning sow, one farrowed thirteen pigs, two eleven each, and one ten—forty-five pigs from four first litters. Another Victorian breeder, Mr. P. J. Nichols, of Ondit, in the Western district, reports very gratifying results.

He has proved the prolific qualities of the breed with a sow from which he reared seventy pigs in seven litters which totalled seventy three pigs.

In support of the contention that this breed is economical to keep, a contention in which a number of Queensland breeders who have the crossbred Large Black Berkshire sows concur, is that they are admirably adapted as a grazier, thus they are particularly suited to the paddock system of pig-raising. The writer has also had considerable experience in grazing Large Blacks and knows their value for this purpose.

They certainly are docile and of good disposition, features which doubtless are to an extent the result of careful selection and breeding over a long series of years. The ears lopping over the eyes doubtless also tends towards keeping the animal contented; they cannot see as well as some of the "prick-eared" breeds, though their sense of smell is particularly well developed.

Overseas experience with the breed for many years past points to their increasing usefulness and popularity both from a bacon curer's standpoint as well as from that of a stud breeder. From the point of view of the farmer desirous of securing early maturing stock these results are worthy of note.

At a recent Smithfield Show (England) Large Blacks put up a wonderful performance, giving an average gain, taken over all the Large Blacks in the show, of 1.47 lb. per day per head from birth.

In one of the largest pedigree herds in Great Britain, at the age of twelve weeks the young Large Blacks averaged 62 lb. each. Another breeder, reporting at same age, had averaged 95 lb. for boars and 84½ lb. for sows. Still another had a sow at seven weeks which was reported as weighing 54 lb., others at sixteen weeks weighed 124 lb. each.

The Large Black Pig Society reports that the Whitley Cup at the London Dairy Show for the best bacon, all breeds competing, has twice been won in succession by the Large Black breed.

The scale of points in judging this bacon was as follows:—

	Points possible.	Points gained.
Correct proportion of cuts or joints, including thickness and streakiness	30	28
Suitability of side, quality of meat, bone, &c.	20	18
Fat on back, lean meat, proportion of lean to fat	30	25
Firmness of fat	15	15
Fineness of rind	5	5

Total points gained, 91 out of 100.

A further proof of the prolificacy of Large Blacks was referred to by Mr. Barker, who reported that three of the imported sows farrowed forty young pigs on the voyage out to Australia.

Another point in favour of the Large Black is their whole black colour, which makes them particularly adapted to grazing.

Large Black Pigs—Scale of Points.

	Points.
Head—Medium length, and wide between the ears	5
Ears—Long, thin, and inclined well over the face	6
Jowl—Medium size	3
Neck—Fairly long and muscular	3
Chest—Wide and deep	3
Shoulders—Oblique, with narrow plate (or shield)	6
Back—Long and level; rising a little to the centre of the back not objected to	12
Sides—Very deep	10
Ribs—Well sprung	5
Loin—Broad	5
Quarters—Long, wide, not drooping	8
Hams—Large, well filled to the hocks	10
Tail—Set high, but not coarse	3
Legs—Short and straight	5
Body and Flank—Thick, well filled	8
Skin—Fine and soft	4
Coat—Moderate quantity of straight silky hair	4
Total	100

Objections.

Head—Narrow forehead, dished nose.

Ears—Thick, coarse or pricked.

Coat—Coarse or curly, bristly mane.

Disqualifications.

Colour—Any other than Black.

Details of the Imported Stock.

The stock imported from England by Mr. Barker consisted of one boar and four unrelated well-bred sows. The boar is "Playford Eros" (Fig. 1), born August, 1922, bred by Mr. S. R. Sherwood, Playford, Ipswich, England, by "Sudbourne Prospect," ex "Playford Venus." The sows are (1) "Swardeston Mozelle," born May, 1922, bred by Mr. A. Beverley Ringer, Mere House, Seething, Brooke, Norwich, by "Martham Hero," ex "Swardeston Moongirl." Her grand dam, "Swardeston Moonlight 6th," gained the championship of the Large Black Pig Society at the Leicestershire, Rutland, and Lincolnshire Shows, in 1920, in addition to a number of first prizes the same year. (2) "Swardeston Devote"

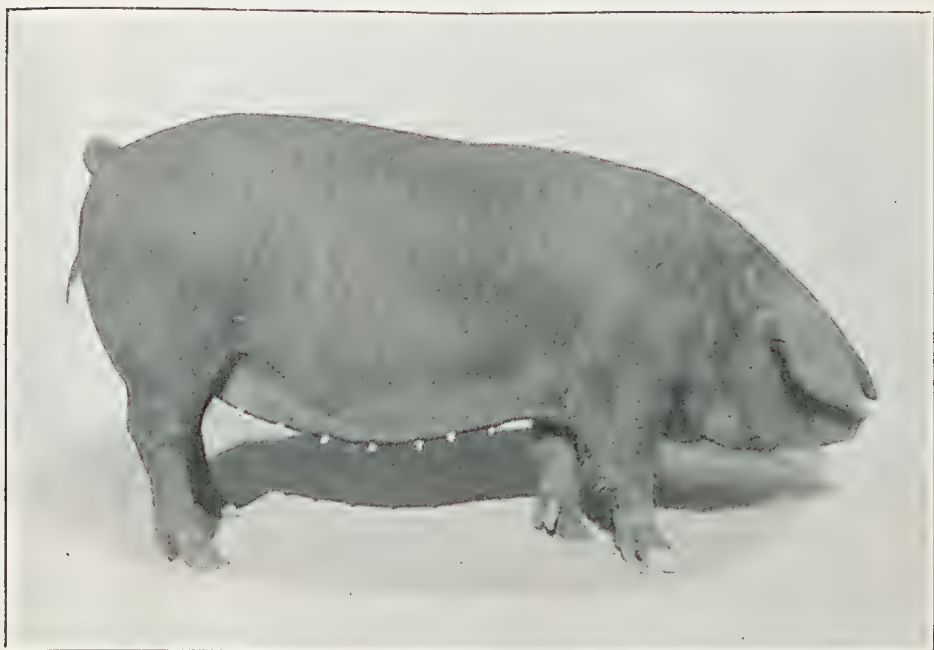


FIG. 4.—"BEVERLEY GIRL" No. 34, IMPORTED IN UTERO AND NOW THE PROPERTY OF MR. BARKER.

A great quality sow. Note the evenly-developed, well-placed line of 14 teats.

(Fig. 2), born June, 1922, bred by Mr. A. Beverley Ringer, by "Bygrave Challenger 2nd," ex "Reydon Discovery." (3) "Westland Rosebud 2nd," born August, 1922, bred by Mr. J. W. Riecard, Scot's Hall, Westleton, Suffolk, by "Westleton Earl," ex "Westleton Rose." (4) "Henham Queen Bess 5th" (Fig. 3), born May, 1922, bred by the Earl of Stradbroke, Henham Hall, Wangford, Suffolk, by "Horsham That's Him," ex "Henham Queen Bess 4th." Before leaving England "Swardeston Mozelle" and "Swardeston Devote" were served by "Treveglos Pride," "Westleton Rosebud 2nd" was served by "Valley Sportsman," and "Henham Queen Bess 5th" was served by "Theberton Dutchman." The grand dam of "Treveglos Pride" is "Treveglos Lass 20th," which was first at the Royal Show, in 1923, for sows born in or before 1921, and first at the Bath and West Show the same year. As will be noticed, the pigs imported by Mr. Barker are descended from prize-winning stock at the leading English shows. The sows "Swardeston Devote" and "Henham Queen Bess 5th" were purchased by Mr. Barker for his son, Mr. W. E. Barker, who has founded a stud at Bendigo East. Mr. Barker, senior, has kept three sows and a boar from "Swardeston Mozelle's"

first litter by "Treveglos Pride," and one sow and a boar out of "Westland Rosebud 2nd," by "Valley Sportsman." "Westland Rosebud 2nd" has recently farrowed to the "Swardeston Mozelle" boar, and she is rearing twelve sturdy piglings out of a litter of fourteen. One of "Swardeston Mozelle's" daughters is rearing a brood of nine by the son of "Westleton Rosebud 2nd." The young breeding stock has grown wonderfully since the Bendigo Show last October. They have not been forced in any way, the sows being run out on pasture and only receive a little slop feed once a day. It has not been necessary to ring one of them, and they do not root or attempt to get through or under fences. Unfortunately, "Swardeston Devote" was injured on the voyage out, and after reaching Victoria she farrowed a litter of fourteen dead pigs. In addition to "Swardeston Devote," Mr. Barker, junior, has "Henham Queen Bess 5th" and a boar and two sows out of her by "Theberton Dutchman" in his stud, and they are of promising appearance. The lineage and splendid quality of these pigs will, no doubt, do much to bring the Large Black into popular favour in Australia.

The sow "Beverley Girl" (Fig. 4), bred by Mr. W. E. Barker, is served by "Theberton Dutchman," and is from "Henham Queen Bess 5th." Fig. 5 is of a trio of Large Black sows owned by Mr. Gordon E. Frost, an English breeder. These sows when four months and three weeks old won first prize at the Essex County Show at Harlow (England).



FIG. 5.

A trio of Large Black Sows owned by Gordon E. Frost, a noted English Breeder. These sows at 4 months 3 weeks old won first prize at the Essex County Show at Harlow, England. The photograph was taken at the Show by the "Agricultural Gazette" Photographer, England.

A GREAT FARROWING RECORD—THE LARGE BLACK-BERKSHIRE CROSS.

E. J. SHELTON, H.D.A., Instructor in Pig Raising.

That the pig is a producer as well as a rent-payer is evidenced by the following record supplied by the owner, Mr. Warden P. Shepherd, of Bannister, *via* Goulburn, New South Wales. Mr. Shepherd writes as follows:—"I am only too pleased to give you as many particulars of my sow and her litters as is possible. The sow is out of a British Black sow and by a Berkshire boar. She is about 3½ years old, and would weigh when fat over 3 cwt. Her last four litters have all been by a pure-bred Berkshire boar; the litters were 14, 16, 13, and 22 respectively; a total of 65, making an average of just over 16 suckers per litter. The last lot are doing well, and are by no means small or stunted, with the exception of one small fellow.

"Before farrowing I fed the sow, together with other sows, on boiled wheat, raw turnips, and a little milk, there being always water in the paddock. The suckers are generally 8 to 10 weeks' old before I sell them. They are readily sought after in this and the Goulburn district, as they are a very fine class of pig for porkers, and also bacon pigs.

"I have only kept one sow of this particular sow's progeny for breeding purposes. I sold this young sow after having one litter from her. She had 12 suckers and reared 11, which were sold for 31s. each at eight weeks old. Twelve out of fourteen of the record sow's first litter averaged just over £2 per head at ten weeks old. I sell the pigs, as a rule, at from 8 to 10 weeks old, and usually get three litters from a sow in about 16 months."

Such a record as the foregoing is surely a creditable one, and is definite proof that, provided the right class of breeding stock is selected in the first instance, and that they are given reasonable care and attention and liberal supplies of food, payable results might be expected.

The British Large Black cross sow mated back to a Berkshire boar should be an ideal bacon pig, a pig whose carcass should suit the present demand for a medium-weight, fleshy bacon.

MIDDLE YORKSHIRE TYPES.

E. J. SHELTON, H.D.A., Instructor in Pig Raising.

Several inquiries have been made recently whether it is advisable to keep Middle Yorkshire pigs in Queensland. One farmer, residing in the Granite Belt, fifty or more miles on the Queensland side of the border, and in the comparatively high mountainous country around Stanthorpe (the Summit is 3,030 ft. above sea-level), recently wrote asking if this white breed would be suitable for his locality, and, if so, whether it would be advisable to cross the sows with a Berkshire boar.

Another farmer, residing nearer Brisbane, said that he had purchased several Middle Yorkshire sows, not knowing much about pigs, but was puzzled to know what class of boar to mate with them, for, as he said, "Tom comes along and recommends a Tamworth, insisting that there is no better breed; then Bill comes along and reckons that Tom knows nothing about pig-breeding, and he promptly advises the use of a Berkshire—and so it goes on." Another farmer has read that the Large Black makes a suitable cross with the Yorkshire.

Now, there is no hard-and-fast rule with our various breeds of livestock; all the breeds are suited to some condition or other, just as it must be admitted that Middle and Large Yorkshires have their place. It would not be right to say that they were breeds unsuited to Australian conditions, as they have enjoyed a great run of popularity here for many years, and in Victoria, South Australia, and many of the southern districts of New South Wales are still great favourites.

On the other hand, conditions generally are against the Yorkshires, as we go north from the northern districts of New South Wales, and there are many districts in Queensland in which the local conditions are unfavourable to white pigs—not to say that Queensland is as hot a place climatically as many Southerners believe, but because the humidity is greater, and in many of the newer dairying districts the pigsty accommodation is very limited and is frequently unsuited even for black and red pigs.

It is for this reason that we would urge all pig breeders to give serious thought to local conditions if they are thinking of introducing white pigs. The Yorkshires are admirable sty pigs, and are specially suited to the requirements of the suburban pig farmer and the stud pig breeder who has superior accommodation and can protect his pigs against the vagaries of the extremes of weather. Given proper care and attention, there are no more prolific or profitable pigs than Yorkshires; but, on the other hand, where conditions are unsuitable, there are several breeds that will prove better paying propositions.

In answer to the question as to the most suitable type of boar to use in cross-breeding where the Yorkshires are being used, the writer advises Berkshires or Poland-Chinas, as these breeds are by nature better suited for crossing with the Yorkshires than the Tamworth or Large Blacks. In any case, these latter breeds should not be crossed with the Large Yorkshires, otherwise the resulting progeny will be too growthy, and will not mature early enough for our market requirements. The Tamworth does not cross so beneficially with white sows as the Berkshire or Poland-China, though where these pure-bred boars are used on Yorkshire cross sows better results are obtained. The British Large Black pig crosses well with the Middle Yorkshire for the production of bacon pigs, but it must be remembered that too much Large Black, like too much Tamworth, is undesirable and should be discountenanced, otherwise the pigs will be too large and will be late maturing.

The more recently introduced type of British Large Black is a far superior type to the "Blacks" we had in Queensland years ago; they now have so many good points as to be well worth consideration as a cross.

At any rate it will pay to give careful thought to the subject if it is desired to test the Yorkshires, of which but one type, the Middle Yorkshire, seems to survive. The Middle Yorkshire is an unsatisfactory pig at present from the point of view of the stud breeder, as there is little or no demand for boars or sows, at least that is the case in most parts of New South Wales and Queensland. Therefore, the farmer interested in the breeding of stud pigs had better, for the present, devote his attention to Berkshires, Tamworths, Poland-Chinas, or the other more recently introduced breeds, and let the existing Middle Yorkshire breeders cater for the limited demand for fresh breeding stock of this variety.

MAIZE REAPER THRESHER.

A Queenslander, Mr. George Iland, of Toowoomba, has invented and patented a machine to harvest, thresh, and bag maize by operating on a ripe standing crop in the field, and has also arranged to have the machine—the Eclipse Maize Reaper Thresher—manufactured in Toowoomba.

The opinion formed after a close examination of the machine and of the excellent work accomplished under average working conditions, was that this complete harvesting device will not only reduce maize harvesting and threshing costs to a minimum, but will eventually prove to be one of the most notable agricultural inventions of modern times. Actually, the cost of harvesting was shown by a farmer who purchased and worked one of the machines to be 2½d. per bushel, allowing for fuel, wages, horses, interest on capital value, and depreciation.

Four horses are used for drawing the machine, the rest of the work being effectively dealt with by a motor auxiliary mounted on the main frame in proximity to the driver.

The process of harvesting is continuous, the maximum quantity of grain harvested during a day of eight and a-half hours equalling 360 bushels. The stalks with adhering cobs are gathered in as the machine is drawn along the row by a series of "rake" chains, which work at convenient positions on the inside of a pair of extension arms which straddle the row of maize operated on. In the harvesting process these stalks are cut off about 15 inches from ground level, and simultaneously, by means of several pairs of plain and serrated edged circular saws, are cut into separate lengths, each about 12 inches long. Cut up in this form they are elevated to the threshing drum, where the ears are husked and threshed, the grain passing either through the concave grid or the trash walkers on to the grain tray; the stalk residues, husks, and cores dropping to the ground behind the machine.

In the cleaning process, the grain is subjected to a strong blast of air when passing through the riddles; gravitating into the elevator boot, it is lifted to the grain-bagging hopper. Bagging (carried out on a platform drawn along at the back of the machine for the purpose) is a continuous process, which, in the 60-bushel crop the machine was working on when inspected, entailed rapid work by the one man it was allotted to. Obviously, the maize-harvesting machine should only be used when both stalk and grain are in a thoroughly dry condition. Frosts occurring immediately after the crop ripens are of assistance in the drying process. Although the machine is designed to lift lodged stalks, and does effectively lift and harvest the grain from any stalks which are leaning over or across the rows, it is an advantage to have an erect, light-stalked crop to operate on.

Where it is purposed to use the maize reaper thresher it is also an advantage to sow the seed right round the field to admit of the rows of corn being continuous.

Reference to the excellent work which this machine does would be incomplete were not attention drawn to the condition of the field after it has been used to take off a crop. "Actually, all stalks and trash are in a fit condition to plough in, a circumstance representing a great saving in time and labour in field operations.—H. C. QUOBLING, Director of Agriculture.



PLATE 105.--MAIZE READER THRESHER AT WORK.

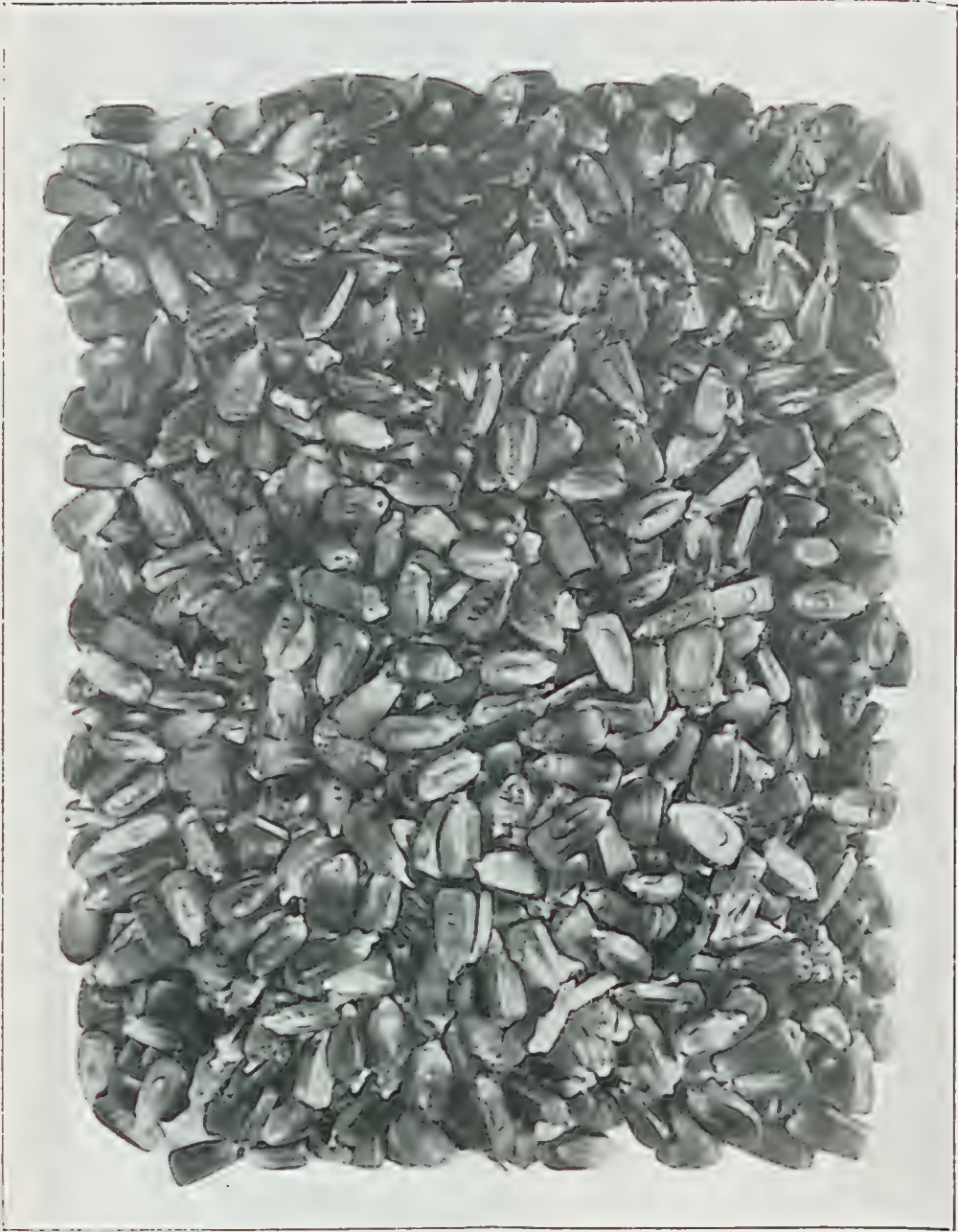


PLATE 106.—CLEANLY-THRESHED SAMPLE OF GRAIN TURNED OUT BY THE MACHINE.



PLATE 107.—CONDITION OF FIELD IMMEDIATELY AFTER REMOVAL OF CROP.



PLATE 108.—“ECLIPSE” MAIZE REAPER-THRESHER.
Horse-drawn, engine-functioned.

THE MOST SUITABLE PIG FEEDS.

One of our subscribers asks for information as to the most suitable food for young pigs after they have been weaned and until they have passed the medium porker stage. Our friend states that he has a limited supply of skim milk and large quantities of barley and corn (both in the green stage), and also oats, as well as some last season's grain. There is also available a plentiful supply of sweet potatoes and a good crop of pumpkins. The problem for solution is—how can these be used for feeding young pigs to the best advantage. The matter was referred to Mr. E. J. Shelton, Instructor in Pig Raising, who supplies the following answer:—

It is preferable to cook the food given to your young pigs and feed the corn (grain), pumpkins, and sweet potatoes as a mash, thinned down with water or skim milk, to the consistency of thick porridge. We would also suggest feeding only a small quantity of corn for a start (preferably crushed) and to gradually increase this as the pigs grow until, as they approach the fattening stage, the amount of bulk can be reduced and the pigs "topped up" principally on grain.

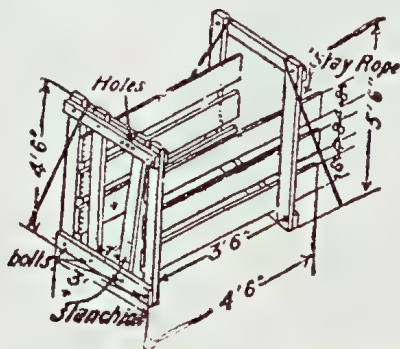
The best protein (or flesh-forming) foods to be used in addition to pumpkins and sweet potatoes are green foods, such as lucerne, barley, green corn stalks, grasses, sweet potato tops, &c. With these available there should be no need to purchase concentrated protein meals, such as meat meal, linseed oil meal, or other like preparations. Probably peas or cowpeas might be grown, the grain from which makes an ideal and a very cheap protein ration. As the season advances, too, there will probably be a more abundant supply of skim milk, than which there is no better growing food for young pigs if it be supplemented with grain in the manner suggested.

It may be mentioned that there is no better grain food for young pigs or for those fattening for well grown stores than barley meal, but you should be careful to crush the grain thoroughly though not to a powder. Barley meal as the grain portion of the ration, supplemented with skim milk, lucerne (both green and as hay), green barley, and oats form a most suitable diet not only for young pigs, but for breeding sows and boars.

Grains should be cooked; the young pigs seem to be able to assimilate the food better, and it is more appetising, though, on the other hand, the margin of profit between cooked and uncooked foods is a very narrow one, and would not justify much money being spent on the purchase of fuel. Cooking also means that one may feed the food warm during cold weather; one may also utilise any meat available, and where calves are being killed off or when old store cows, &c., are slaughtered this is a decided advantage, but the meat should be thoroughly cooked and mixed with the other foods in the manner suggested to obtain the best results.

CATTLE CRATE.

The cattle crate illustrated, taken from the quarterly bulletin of the Michigan (U.S.A.) experimental station, has been in use there for three years, and has proved especially useful in transporting cattle for breeding purposes, or when sold or



exchanged. It may be used either in a wagon or in a motor-truck. Two such crates fastened together can be used on a flat rack, as a double unit. The usual dimensions are 4 ft. 6 in. long, 3 ft. wide, 4 ft. 6 in. high in front, 5 ft. 6 in. high at the rear. The remaining details of construction can be gathered from the illustration.

General Notes.

A Novel Type of Silo.

During the past few years ensilage has gained considerable favour among arable farmers, and the tower silo is becoming a familiar feature of farm steadings. Tower silos are being made of various materials, and in the neighbourhood of Worcester there may be seen three silos which were at one time the funnels of an Atlantic liner. These have been in use for a number of years, and give good results.—J. R. BOND, in the "Journal of the Ministry of Agriculture," England.

Rural Life in Denmark.

Rural life in Denmark forms a vivid contrast to rural life in this country. Here the unrelieved monotony of the countryside has caused a rush to the cities and large towns. In Denmark the universal use of electrical energy has brought most of the comforts and some of the attractions of modern civilisation to the countryside, where contented people labour with a light heart.—E. O'SHAUGHNESSY, in the "Journal of the Department of Agriculture and Technical Instruction," Ireland.

Milk Recording in Denmark.

In 1895 the first Danish Milk Recording Society was formed by thirteen farmers, who owned together just over 300 cows, and who combined to employ a man to record the yield of milk and its content of butter-fat from each cow on their farms. Other groups of farmers followed suit as the practical value of the information obtained and its importance in cattle-breeding became recognised. Now there are in Denmark 825 recording associations, dealing with 25 per cent. of all the cows in the country, or upwards of 300,000.—"Scottish Journal of Agriculture."

A Jersey Record.

The young Jersey cow, Sylvia's Pet, born 5th May, 1920, on her first calf when 2 years 144 days old, yielded 10,175 lb. milk, 564 lb. fat, in 363 days, and calved again on 4th November, 1923. She was fed 30 lb. swedes, 14 lb. potatoes, 15 lb. clover hay, 2 lb. oats, 2 lb. maize, 2 lb. oil cake, or a total of 24 lb. of dry matter per day. Her dam, Sylvia, yielded 6,130 lb. milk, 5.6 per cent. of fat, in forty-five weeks, and her grand-dam, Spangle, produced 8,050 lb. milk, 4.9 per cent. of fat, in forty-seven weeks. These figures are verified by the English Jersey Cattle Society.

The Problem of Pest Control.

Many an isolated fact, apparently of no economic importance, has subsequently proved to be a vital link in a chain of facts that have a far-reaching practical value. Instances might be multiplied from all over the world where much might have been done to control insect pests with a minimum of delay if only more had been known beforehand as to their life-history and distribution. If, for instance, we had known fifteen to twenty years ago what we know now about the pink boll-worm of cotton (*Platyedra gossypiella*), which is probably indigenous only in India, and is an imported pest in Egypt and elsewhere, what vast sums of money could have been saved, and how much better the prospects of controlling this most serious menace to the cotton crop of the world would have been!—S. A. NEAVE, in "The Empire Cotton Growing Review."

Red Polls in England.

Red Poll cattle were shown to great advantage at the English Royal Show. The champion bull, Hatton Fabulist, four years old, from a cow which has averaged over 9,000 lb. of 4 per cent. milk for the last five years, weighs 1 ton. The second bull in the same section weighed still more, and the third bull, Knepp Crown, scaled 23 cwt. The champion cow, Royal Mavis, won premier honours for H.M. the King in the previous year. A fourth prize was won by S. W. Copley, a West Australian settled in Herefordshire.

Grissenhall Wild Girl, a Red Poll eight year old, belonging to Mr. J. B. Dimmock, Harleston, Norfolk, has yielded 20,060 lb. milk in 365 days, and was giving 50 lb. a day after milking for thirteen months. At the London Dairy Show she won the National Cup for cow giving the biggest weight of milk in proportion to live weight.

Silage and the Quality of Milk.

The opinion is held by some farmers that silage will taint the milk of cows to which it is fed. This opinion has not been confirmed by official feeding trials with silage at Wye (England). "On no occasion," says a report in the "Journal of the Ministry of Agriculture," "has any bad flavour been noticed, and during the time the 1922-23 trial was being carried out the college herd was included in the Kent clean-milk competition, in which it was placed second. While the competition was in progress the milk was examined periodically by a dairy expert." It is added that the fat content was taken regularly during the trials, and that the records did not indicate that the change from roots to silage, or *vice versa*, had any definite effect upon the quality of the milk.

A Wonderful Country.

Acknowledging a civic reception at South Brisbane recently, the Governor-General, Lord Forster, said that the more one was able to travel about Australia, the more one wanted to see. It was full of interest and full of encouragement. Even in spite of the bad seasons, such as had been experienced in parts of Queensland, one could see enough to indicate what a wonderful country they had in this great Commonwealth. It was perfectly astonishing. They could rely upon it that when he went back to England, Australia would have no truer friend and no warmer advocate of its possibilities than himself. He would do what he could to let the people know more clearly what Australia was. It was not until he came out here that he realised how little the people of England knew about Australia. Now, however, the people at home had at last awakened to the fact that there in the Southern Seas was a golden opportunity for men and women with pluck and good physical strength such as existed nowhere else in the world.

Flock Improvement in Central Queensland.

While Central Queensland, at least the western areas, are especially adaptable for sheep-breeding, having the finest country possible in the world for this purpose, and while Central Queensland is noted for its splendid wool, yet the care and attention given by the growers—or a majority of them—has been the deciding factor. They have not hesitated to import the best of rams and ewes, giving high prices, to improve their flocks. There are now many noted flocks both among the pastoral lessees and the grazing farmers, whose enterprise is reflected in the prices they receive for their wool. At the recent ram sales in Brisbane Mr. R. Stevenson, of Smiths' Lagoon, on the Lower Barcoo, purchased eighty-nine rams. Mostly they came from Mr. H. M. Collins' "Lamara" Stud in South Australia. The balance were from Messrs. H. C. Collins and Co.'s Lucerndale Stud in South Australia and Mr. Thos. Milliar's Deniliquin Park Stud in New South Wales. Fine big fellows they were, showing any amount of quality, with a good staple. When one sees the small men, as the grazing farmers are generally known, making important purchases like this there is no reason to fear for the sheep industry or that the quality of our sheep will deteriorate. The owners are to be congratulated upon their enterprise in making such a valuable purchase.—"The Capricornian."

The Feed Factor in Dairying.

The value of better feeding methods in relation to dairying is referred to in a letter received from Mr. Geo. H. Walker, of Wollongong. "For upwards of fifteen years," he says, "I have kept a cow for household use, but have never considered the question of a balanced ration until I read the article by Mr. A. H. Haywood in the April, 1923, 'Gazette.' For years past I have been content to get enough milk for daily use, but the article determined me to try the ration quoted, consisting of maize (cracked) 30 lb., bran 20 lb., oats (crushed) 10 lb., and linseed meal 5 lb., feeding 1 lb. of this mixture daily for every 4 lb. of milk yielded."

This ration was supplemented with a kerosene tin of chaff at each meal, and maize meal was used instead of cracked maize, as the cracked maize was passed undigested, probably owing to lack of roughage. The cow (a pure-bred Jersey on second calf) was confined to an allotment of 200 ft square.

From 7th June, 1923, to 6th March (273 days), she yielded 6,266 lb. of milk, and although butter-fat tests were not carried out sufficiently systematically to have great significance, the results of the experiment have been so satisfactory to Mr. Walker that he has advised several progressive local farmers to set aside two or three cows and to feed them according to the recommendation quoted, their performances to be subsequently compared with those of selected cows fed under usual conditions.—"Agricultural Gazette of N.S.W.," for August.

Management of the Bull.

The bull constitutes 50 per cent. of the breeding herd. The selection of a bull to head a herd is very important. Breeding cattle, whether they are females or males, should be purchased subject to the tuberculin test and a sixty or ninety-day retest. In the selection of a bull the conditions under which the bull has been kept must always be taken into consideration. Bulls that have been pampered and fitted several times for shows are sometimes a disappointment. In changing bulls it is advisable to keep the old bull until the newly acquired animal has been proved satisfactory.

An improperly managed bull frequently develops into a troublesome and, in some cases, a vicious animal. On the other hand, a properly managed bull will not cause any more trouble or care than a cow.

A double ring should be placed in the nose of every breeding bull, and he should be taught to lead by a strap or staff. He should be provided with well-bedded, dry sleeping quarters during the cold weather, and his pen and lot should be well drained to prevent excessive dampness and mud.

It is advisable to begin conditioning the bull about six weeks or two months prior to the time that he is to be put into service. The ration for conditioning should contain more protein in proportion than a maintenance ration. Conditioning for service consists of increasing the vigour, vitality, and durability of the bull, thus producing a more potent and active breeder.

The frequency of service will depend upon the age and condition of the bull. The service should be less frequent in the beginning of a season. Bulls under two years of age should not be put to service more than once or twice monthly, until they are proved. Potency of a bull is frequently diminished by excessive service while the animal is immature.

Bulls should be removed from service at the first indication of over-work, placed in comfortable quarters, and if the testicles are swollen a competent V.S. should be called. The length of time that overworked bulls should be kept out of service will depend upon the vitality of the animals, and will vary from ten days to a month, and in extreme cases perhaps longer.—A. T. KINSLEY, in the "American Hereford Journal."

Phosphates and Feed.

That there is a close relationship between the quality of pasture and the constitution, robustness, vigour, health, and production of animals feeding on it is explained in a bulletin just published by the Victorian Department of Agriculture, and written by Dr. A. E. V. Richardson, M.A. Dr. Richardson proves by illustration that there is a close relationship between the chemical composition of the soil and the character of the grass grown on the soil. In tests carried out by Miss Hilda Kincaid, at the Melbourne University, it was found that some Australian grasses have a markedly lower phosphoric acid content than those of Europe, also that acclimatised European grasses have a much higher phosphoric content than native Australian grasses, but lower than the same kinds of grasses grown in Europe. This weakness must reflect itself in our sheep and cattle, because in combination with lime and magnesia phosphoric acid forms 85 per cent. of the ash of bones. Animals fed on foods deficient in phosphates soon become abnormal, exhibiting weakness of limbs and debility, as in cripples, while if the diet is made normal, they gradually recover. By using phosphates at the Rothamstead Experiment Station, England, the phosphatic content of grasses was more than doubled, and that of the legumes (clovers and trefoils) was increased by 80 per cent. As Dr. Richardson says:—"Being richer in phosphates, the grass on the manured land will be especially valuable for ewes in lamb, for dairy cattle, and for young growing stock."

Moreover, it is shown that top-dressing stimulates deep rooting habits—beneficial whenever and wherever drought conditions are likely to prevail—encourages early growth, economises the use of soil moisture, and "increases the bulk, succulence, and palatability of the herbage on grass land." Finally, superphosphate is declared to be the most effective form of phosphates to use, because it becomes so readily available to the plants. Thousands of dairymen and sheepmen in Victoria have had practical proof on their own holdings of the accuracy of the deductions made by Dr. Richardson, and those who have not are obviously neglecting to sensibly nurse their soils and the animals in their care, independent altogether of the fact that they could make more money out of their properties by top-dressing. If they have not already done so, they should lose no time in putting the lessons of science into practice, for, according to Dr. Richardson, top-dressing, combined with a sane system of grass improvement, is capable of increasing production as greatly in the grazing area as manuring has influenced it in the Wimmera.

Allocation of Durango Cotton Seed.

In the course of a recent Press interview the Minister for Agriculture (Hon. W. N. Gillies) stated that the seed of the Durango variety of Upland cotton is being allotted and distributed by the Department of Agriculture and Stock to the various districts which have been selected by the Fieldmen of the Cotton Section of the Department. In making the selections of these districts the officers responsible for the distribution of the Durango seed have endeavoured to secure areas isolated from any planting of ordinary cotton, by at least half a mile—the distance of isolation which is considered necessary to prevent cross-pollination between cotton varieties. The task is a difficult one now that ratooning is permissible, and it has been found necessary to omit many sections on this account. Small individual plots of Durango have also been distributed throughout the whole portion of the cotton belt of the State in order to test the suitability of the districts in which it has not been possible to allot any group areas. Seed for only 10,000 acres of Durango is being distributed, and, of course, it is impossible to satisfy all demands. It is anticipated, however, that the seed from this acreage will be sufficient to meet all demands in future and to plant up to 300,000 acres in the following season.

Stallion Clubs in Canada.

The policy of making grants to clubs that hire approved stallions, says a recent report of the Canadian Minister of Agriculture, was started in 1915, the scheme (which is based on the "Scottish premium system") providing that any district which forms a club for the purpose of hiring an approved pure-bred stallion, and which complies with the regulations, is paid a grant equal to one-third of the amount paid by the club members as fees to the stallion owner. By this means the owners of mares and the proprietors of good stallions are both benefited. The former are enabled to secure the services of a first-class horse at a very nominal fee, while the latter are assured by contract of a certain definite return from the service season. Thus the keeping of good stallions is made possible, while community breeding and better feeding, care and management are encouraged among the mare owners.

The organisation of communities for the purpose of hiring a stallion has in many cases only been one phase of the work. Colt shows have been established, which have done much to create an interest in better breeding and at the same time have been the cause of leading the breeders to study all phases of the question in an endeavour to produce winners. Community horse sales have also been carried on in certain districts, and a healthy rivalry has sprung up in sections as to which club will secure the services of the best stallion.

Clubs are required to stick to one breed, and thus grade up a definite type in the community. All stallions for club use are inspected by experienced horsemen and judges, only sound, individually excellent animals that possess the size and characteristics of the breed required being allowed to stand for service.

Staff Changes and Appointments.

Messrs. Henry Barnes, Albert Edward Taylor, William Stanley Collins Warren, Francis O'Connor Cassidy, and Herbert Hungerford Batchelor have been appointed officers under and for the purposes of "*The Animals and Birds Act of 1921*."

During the absence on leave of Mr. F. F. Coleman, Expert and Inspector under "*The Pure Seeds Act of 1913*," Mr. F. B. Coleman has been appointed an Expert for a period of six weeks as from the 14th September, 1924.

Acting Sergeant W. E. Corney, of Bowen, has been appointed an Inspector of Slaughter-houses as from the 1st September, 1924.

Messrs. R. L. Prest, H. St. J. Pratt, F. L. Jardine, and S. E. Stephens have been appointed Inspectors under "*The Diseases in Plants Acts, 1916 to 1924*." The appointments will take effect as from the 20th September, and will be on probation for a period of six months.

W. C. Keany, who has been Poultry Instructor for the Department of Agriculture and Stock at Townsville, has resigned his position.

Constable T. J. Quinn, of Calliope, has been appointed an Inspector under and for the purposes of "*The Slaughtering Act of 1898*," as from the 5th September, 1924.

W. M. Wheatley, Cinnabar, has, on the recommendation of the Council of Agriculture, been appointed Chairman of the Peanut Board.

"The resignation of Mr. John Armstrong as Government Representative on the Tambe Dingo Board has been accepted, and Mr. F. L. Barry has been appointed in his stead.

The Value of Colour in Milk.

Colour in milk is a point of some commercial value, says F. J. Doan, of Maryland Agricultural Experiment Station, in the "Journal of Dairy Science," the average consumer preferring a yellowish milk, thinking it to be richer in cream (butter-fat) than whiter milks. While this is true in general of milks where the pigmentation of the fat is approximately equal, it does not hold in the majority of cases. The demand for yellowish milks should, however, be encouraged for quite another reason.

It was at one time suggested that carotin and fat-soluble A vitamin were identical, or at least were always found associated. While this theory has been disproved, it is still a fact that milk from cows fed on ample quantities of green vegetation is higher in vitamin content than milk from cows fed on bleached hays, silage, most roots, and grains. Thus it follows that summer milk is richer in vitamins than winter milk under prevailing American and European conditions of production.

In a final analysis, says this writer, it may be found that the colour of cows' milk or the colour of milk fat is of no great importance, but from our present knowledge colour does seem to be an indication of the vitamin A value of milk used for a food, and possibly an indication of the presence or absence of other vitamins as well. This statement applies only to milk produced under conditions referred to.

Manufacture of Home-made or Dairy Butter.

Presuming the cream and a hand churn are available, let the cream ripen until it is sour to the taste, then put it in the churn at a temperature of, say, 55 deg. Fahr. The air vents should be opened after the first few revolutions to let off gas, and this should be repeated three or four times at half-minute intervals. Revolve the churn or turn the beaters so as to agitate the cream for about thirty to thirty-five minutes. The glass on the churn should then show slight signs of washing clear; add a little cold water to the cream, taking the lid off the churn to do so. Having added water, say 1 pint to a gallon of cream, set the churn going again until butter is in granular form about the size of shot; open the drain taps and drain off the buttermilk. Add cold water until the butter grains float freely; revolve the churn for half a minute and drain off; add a fresh lot of water, revolve again, and also drain this off. This wash water should come away clear or with just a very faint milky tinge.

Now take the butter out of the churn and add fine powdered salt at the rate of about $\frac{1}{2}$ oz. to 1 lb. of butter. If mildly salted butter is desired, add a little less than this; if a distinct salt flavour is desired, add a little more, but do not exceed $\frac{3}{4}$ oz. Work the salt thoroughly through the butter with pats, touching it as little as possible with the hands. A small roller worker can be purchased for this purpose. Let the butter stand for at least six hours so that the salt may melt thoroughly, then rework for about five minutes, taking care not to work too much, or it may become greasy.—L. T. MACINNES, New South Wales Dairy Expert.

Calf Selection.

A good deal of culling is possible each spring, not so much amongst the mature cows as amongst the calves. Many dairy farmers make a point of saving all heifer calves, others again make a point of killing them as soon as they are born. Either extreme is harmful, because in one case many are kept that should not be allowed to live, and in the other case many that would become valuable are never given a chance. It is not at all likely that even the good cows will always produce good calves, but it is a certainty that the poor cows will usually throw poor calves. There are certain infallible guides to selection, and amongst the most important comes trueness to type and the money-making organs properly developed. In the case of dairy cattle the young heifer will show at the moment of its birth whether or not the udder is properly formed and developed. If dairy farmers would just make a careful examination of the heifer calves they would be able to do a good deal of their culling at that stage. Even the best-developed calf may go wrong, but the worst-developed ones will never come right. Select for rearing only those calves that have the udder well spread with the teats well placed and apart. There are indications there of good milking capacity, and that is usually what the calves are being kept for. There is no profit in feeding poor ones; rather concentrate on fewer animals that have the makings of good ones. The whole land is entering into the busy season of the year, when it is a case of going from daylight to dark. At the moment it would appear as though the prospects ahead are good, and it is to be hoped that the markets will remain good, so that there will be a payable return for our produce.—"New Zealand Farmer."

A Profitable Co-operative Venture.

An interesting experiment in practical co-operation was described in an address at the recent State conference of the New South Wales Agricultural Bureau, when the saving to be effected by pool-buying of farm and household requirements was brought before the notice of delegates by Mr. F. P. McFarlane, the representative from Yarramalong.

It was in 1921 that it occurred to members of this branch of the Bureau that they might increase the purchasing power of their earnings by buying on a better market, an order for £26 worth of goods being made up by six members, and one member being appointed buyer and distributor on a percentage basis. The first order proved such a success that the next one was increased to £40, with more buyers, and the third order to £300, with about forty buyers, since when the branch has turned over about £8,000 worth of such requisites as groceries, boots, fertilisers, seeds, and farm implements.

It soon became necessary to build a store and alter the method of distribution, a motor lorry being eventually used and a second member employed. Success had been achieved, it was stated (1) by allowing no credit, (2) by retailing the goods plus bare cost, and (3) by making the share or deposit only small, a member being required to find only £1, which he lent to the branch on call. The funds of the branch when the movement was started amounted to only about £28; the assets were now worth at least £250, a sum which had accumulated principally as an over-run on goods distributed. Bad debts amounted to less than £3. The saving effected had been more than 10 per cent., but estimating it at that figure £800 had been retained in the pockets of members, to say nothing of the effect of the activities of the branch on local prices.—“Agricultural Gazette of N.S.W.” for August.

Transfer of Banana Plants.

A Proclamation has been issued under the Diseases in Plants Act permitting the transfer of banana plants from one part of Queensland to another, excepting the region described as follows:—

All that portion of Queensland commencing at Double Island Point, and bounded thence on the north by a line bearing westerly to a point ten miles due west of Gundiah, on the Main Northern Railway Line, on the west by a line bearing southerly to a point five miles due west of Brooloo, on the south-east by a line bearing north-easterly, through Pomona to the coast; and thence by the coast to the point of commencement.

Banana plants may be removed from the area described above on the following conditions:—

- (a) The whole of the stem and leaves of the plant to be first removed from the corm;
- (b) All roots and loose material removed from the corm;
- (c) When banana weevil borer is present in the nursery, orchard, or place from which the corms are being obtained, no corm shall be taken from any stool of bananas in which any weevil borer or any trace of a weevil borer is visible, and, further, no corms shall be removed from such place unless and until they have complied with the foregoing conditions, and with conditions as follows:—

That all ground within the distance of three yards from the place where such plant so to be removed is or has been growing is and has been kept in a state of thorough cultivation for at least twelve months prior to the digging of the plants;

That every plant so treated shall be at once placed in a cart and removed from the place where grown in such manner as to prevent its coming in contact with the soil, and then forwarded direct to its destination, or stored on a framework raised at least 2 feet above the ground and not less than 200 yards from the nearest banana plant;

- (d) Any banana plant removed under the provisions of the Proclamation shall at all times during its removal have attached to it or to the package or crate wherein it is contained, a certificate to the effect that such plant or plants comply with the conditions laid down in the Proclamation dated the 2nd October, 1924, and published in the *Government Gazette* of the 4th October, 1924, such certificate to be signed by the occupier of the nursery, orchard, or place from which such plant is being or has been removed.

This Proclamation does not refer to the fruit of the banana, and does not apply to the State Nursery at Bribie Island.

A Correction.

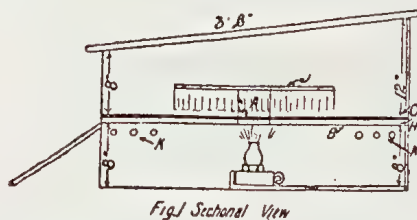
Among the general notes in the last issue (September) of the Journal there appeared a paragraph headed "Bananas in Western Queensland." "Bananas" should have read *Tomatoes*. To associate bananas with the context of the paragraph would be plainly absurd. The obvious error was due to a clerical oversight.

Agriculture on the Screen.

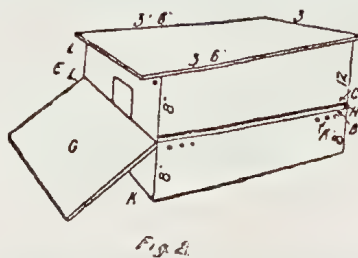
Motion pictures have been used by the Live Stock Branch during the past two years. Some strictly technical films have been made. Scenarios are prepared by officers of the Branch, who also superintend the locating of suitable settings for the pictures, the necessary properties, and other details. Although there is a certain disadvantage in the treating of highly technical subjects, this will be practically eliminated by the use of a projection machine with a special shutter, which allows for the stopping of the machine at any particular scene. The programme of the meetings at which these pictures are shown is usually arranged to provide some variety. The motion picture as a means of actually depicting agriculture in all its varied phases is increasing in popularity. Officers report good results from the use of the pictures, which are in increasing demand.—W. R. MOTHERWELL, Canadian Minister of Agriculture, in a recent report.

HOME-MADE BROODER.

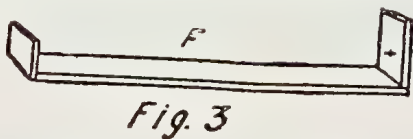
The suburban poultry-keeper who has been using brooders of the pattern illustrated for some years does not claim any originality for the design, but states that he is perfectly satisfied with the results obtained from its use. Fig. 1 shows a vertical section of the brooder; Fig. 2, a perspective view; and Fig. 3, F, the slide to



carry the lamp. A is a tin cylinder made by cutting out the top and bottom of a fruit tin. This reaches through a circular hole cut in the floor, C, down to the galvanised iron sheet, B. This galvanised iron sheet, B, is 1 in. below the wooden floor, C, and by means of it the heat is distributed over the whole of the floor and through to A. The floor, C, is made of lining boards, and as previously stated, is



1 in. above B; and has a circular hole in the centre, to allow passage to A. The lid, D, made of flooring boards, just rests on the top of the walls, and can be lifted off. A circular piece of wood, J, 2 ft. in circumference, rests on top of the cylinder A, and has a strip of blanket tacked round it, the blanket just reaching to the floor,



and being cut into strips about 3 in. wide, a little over halfway up, to allow chickens to go in and out. The exit for the chickens, E, is fitted with a drop shutter. The platform, G, makes it easy for the chickens to run in and out. Ventilation holes, K, in the lamp compartment allow the fumes to escape. Air holes, L, are also provided for the top compartment. This brooder will hold 100 chickens.

Answers to Correspondents.

Pig-Raising.

G.W.L. (Brisbane).—The Instructor in Pig Raising, Mr. E. J. Shelton, advises:—

- (1) *Amount of capital required to engage in Pig Raising?*—This is a difficult question to answer. The writer has known men start with £10 and eventually succeed in making a comfortable living. On the other hand, it would be a decided advantage if capital were available to the extent of, say, £500 to £2,000. There is no limit to the amount that could be invested nor is there any minimum. The purchase of the farm will, of course, be the largest item, whether this is purchased by cash or on terms will make all the difference. To go in for pigs on the paddock system nothing less than 50 acres should be acquired, and if 100 acres are available it will not be too much. Suitable improved land can be purchased at up to £20 per acre on terms, or if unimproved land is taken up it will, of course, be cheaper. The amount to be spent on buildings will, of course, vary considerably. Suitable buildings may be erected at comparatively low cost by a farmer who can do carpenter's work. At any rate, convenient sanitary buildings are a necessity, and we hope at a later date to have a pamphlet issued dealing with the construction of pigsties. The purchase of breeding stock is an important item. The writer considers that to make a living out of pigs at least thirty breeding sows and two boars are required. Of course these would not all be purchased at one time, but would be secured as required. It is first necessary to have the farm and a liberal food supply before taking on the breeding stock.
- (2) *District Most Suited for the Purpose.*—There are many districts in Queensland suited to pig-raising. Some are near at hand as in, say, the Fassifern Valley, where there are extensive areas of rich land available at from £15 and £20 per acre improved. Then further afield there is the Atherton Tableland, where some of the finest land in the State is available at from £5 to £20 per acre improved.
- (3) *Type of Pig Most Suitable.*—The most suitable type of pig will depend to some extent on local conditions. If you are situated in a district where there is likely to be a good demand for breeding stock, it would pay to specialise in a breed like the Berkshire and have young pigs available for sale as breeders to farmers. On the other hand, if you are situated away from a local market, it would probably pay to breed bacon pigs, and for this purpose a purebred Berkshire boar and crossbred Tamworth-Berkshire sows or grade sows generally will be found suitable. If you are prepared to make a speciality of pig-raising, then by all means specialise in purebred stock.
- (4) *Disposal of Stock when Produced.*—There is an ever increasing demand for all classes of pigs; the largest demand in Queensland, however, is for light to medium weight bacon pigs, varying from 5½ to 6½ months old, and in weight from 105 to 120 lb. dressed weight—i.e., from 150 to 170 lb. live weight. You need have no fear of over-supply; the bacon factories are capable of treating all the pigs likely to be available for some years to come.

There is a growing demand for store pigs also; this is purely a local market, but it is one that is worthy of consideration.

- (5) *Where to Secure Stock.*—When you are ready we will be pleased to put you in touch with breeders who have stock for sale.
- (6) Pig-raising is largely an adjunct to dairying and mixed farming; neither of these industries is confined to what might strictly be called coastal areas. The Murgon-Kingaroy districts, for instance, are large pig-raising centres; they can hardly be classified as coastal areas. At the same time pig-raising is not altogether a suitable industry for what are commonly regarded as "out back" districts.
- (7) There should be no difficulty in getting in touch with breeders who are competent to give you a few weeks or months' practical training. We are forwarding you a copy of the August issue of the Journal. If not already a subscriber, you should fill in the order form which will be found among the advertisements.

Passion Fruit Injury.

S.K.R.R. (The Gap)—

The Director of Fruit Culture, Mr. A. H. Benson, advises that, judging by the specimen of passion fruit submitted, the injury was probably caused by a sucking bug when the fruit shell was soft on the vine. These bugs are fond of the prickly (African) cucumber, and may be attracted by slices of the cucumber. If the slices are treated with arsenical poison the bugs will be destroyed in large numbers.

Swingle Bar—Cementing Old Tank.

C.E.B.W. (Tweed Heads)—

- (1) Mr. A. E. Gibson, Instructor in Agriculture, advises that, in order to make a three-horse plough bar, the "B" bar should be 4 feet 9 inches long. Allowing that the pull is taken at 1 inch from each end of the bar, this would give a distance of 4 feet 7 inches in between; consequently the line of draught should be taken at a distance of 19½ inches from the extremity of the bar on the left-hand side.
- (2) Cement washing of the outside of the tank is recommended, even if the question of expense of plastering is not entertained. The wire netting alternative inside the tank is not thought practicable. Follow the general directions as to how to repair a leaky tank which you quote and which was published in the Journal for January, 1919. The strength of the tank stand is obviously an important factor. Perhaps you would find it more economical to replace the old tank with a new one.

Hog Lice—Poland-China Pigs.

W.F.L. (Boonah)—Mr. E. J. Shelton, Instructor in Pig-raising, advises:—

1. The most efficacious treatment for lice is to prepare a mixture of—Benzine, ½ pint; kerosene, ½ pint; crude oil or fish oil, 7 pints. This makes up into a gallon of mixture which should be stored in a tin container for use as required. Before applying the oil, place the pigs in a clean pen and wash them well, using lukewarm water and either Sunlight soap or soft soap. After the pigs have "dried off" apply the lice mixture by hand, rubbing it well into the crevices behind the ears, along the neck and sides, and on the hind legs. Be careful also to see that some of the mixture finds its way just inside the ears, where lice congregate freely. Keep the pigs in the pens for three days, then give them a second oiling; this is necessary by reason of the fact that the eggs ("nits") of the lice hatch out in three days after being deposited by the female lice on the hair, &c.; the second application of lice mixture catches this young brood and destroys them. After this treatment it should not be necessary to treat the pigs for some months, but it pays to be constantly on the lookout for these parasites. Cleaning up the pens, white-washing, &c., are also effective in getting rid of them.
2. The Poland-China will be found a very useful type of pig for cross-breeding in the manner suggested by you. It is a quick-growing, early-maturing, easy-feeding type suitable both for porkers and for light to medium bacon pigs.

If you state the number and sex of the Poland-Chinas you require, we shall be pleased to put you in touch with breeders of this type. The writer will be inspecting some at Broxburn, near Pittsworth, shortly, the property of Mr. J. H. Whittaker.

A USEFUL HEALING OINTMENT.

The following prescription is well worth note. It is of a useful healing ointment for application to open wounds, such as those resultant upon castration or operations on abscesses. The wound should be thoroughly cleansed before applying the ointment, and until healing takes place the pig should be kept separate from the rest of the herd in a clean, dry sty.

The ointment is composed of—

Iodoform	..	..	..	..	1 part.
Oil of Eucalyptus	..	..	..	..	14 parts.
Olive oil	..	..	..	..	20 parts.

It should be kept in a clean porcelain or glass container, and should be on hand at all times in case of emergency.—E. J. SHELTON, H.D.A., Instructor in Pig Raising.

Farm and Garden Notes for November.

FIELD.—Farmers are commencing to realise that quick-maturing wheats which possess a degree of rust resistance are more dependable than the slow-growing and often rust-susceptible kinds, which are gradually giving place to these and mid-season varieties.

Growers are advised to make every preparation to work up the surface of the ground immediately after the removal of their crops, so that the soil may be put into good condition to receive any rain which falls, the conservation of which is the best guarantee for the success of the next succeeding crop. Such initial preparation also encourages the early growth of all foreign and weed seeds, and permits of their eradication by the implements used to produce the desired soil mulch. In such manner paddocks are kept clean and the purity of crops is maintained. The careful preparation of areas intended for maize-planting cannot be too strongly impressed upon growers. Deep and thorough ploughing, followed by cross-ploughing and subsequent cultivation of the soil, must precede sowing if success would be attained; and all efforts must be concentrated to obtain a good surface mulch. Failure to follow up the subsequent sowings by harrowing prior to the appearance of the young plant conduces to weed growths and very often entails, by neglect of this operation, subsequent hand-hoeing between the plants in the drills. Harrowing should be discontinued before the plant breaks through the surface, otherwise damage will accrue to the tender shoots of the young plants. When the young maize plant has hardened up it may, with advantage, be lightly harrowed in the direction of the drills, but such practice must discontinue once the plant has attained a height of 6 inches. Close cultivation by inter-row cultivation implements is necessary after every shower to conserve moisture and to prevent weed growth, care being taken to ensure each cultivation being shallower than the preceding one, and so prevent damage to the root system of the plant, which is extensive. Inter-row cultivation should cease with the advent of the cob on the plant; and, if proper attention has been given to the crop, it should, at this period, be unnecessary. Where crops are planted on the check-row principle, inter-row cultivation is facilitated, and more even crops result.

The French millets (red and white), owing to their rapid maturing qualities, form excellent intermediate or supplementary crops, and are suitable for present sowing. Their value for fodder and seed purposes is worthy of more general recognition at the hands of the average farmer.

Past dry periods have impressed upon us the necessity of providing during good seasons against the return of less favourable ones, and in this connection the cultivation of quick-growth fodder plants appeals to us. Many varieties of useful classes of fodder can be cultivated over a large portion of this State; chief of which, perhaps, are the sorghum family for grain and fodder purposes. Of the latter, Sudan grass has much to commend it, and is fast becoming one of the most favoured by stockowners. Grain sorghums, of which Feterita, Red Kafir, and the various Milos are examples, should occupy a more prominent position for purposes of horse and pig feeding, and are particularly suited to those localities which are unsuitable for maize production. Some varieties of sorghum have strong frost-resisting qualities, and lend themselves to those localities where provision for some form of succulent fodder is necessary during the winter months.

Orchard Notes for November.

THE COAST DISTRICTS.

November is somewhat of a slack month for fruit in the coastal districts, as the citrus crop, excepting a few Valencia Late oranges, off-season lemons, and a few limes, is over. Pineapples are also scarce, as the late spring crop is finished, and there are only comparatively few off-season fruits ripening. The main summer crop of fruit in the principal producing districts is only in the flowering stage, though that in the more tropical parts is ready for marketing. It is also a slack month for

bananas, as the summer fruit is not yet fully developed, and the bunches that make their appearance are usually poor. They have been slow in developing on account of the comparatively cool weather of winter and early spring, when the suckers were more or less at a standstill. Young suckers should, however, be making vigorous growth now, and the plantation will require constant attention to prevent the stools being overcrowded with too many suckers. Keep the land well worked and free from weeds of all kinds, as good growth now means good bunches in the autumn and early winter. Where there is a danger of the soil washing badly with heavy rain, rows of Mauritius, velvet, or other suitable beans should be planted at right angles to the fall of the land, as the growth they make will tend to hold the soil and thus save any from being washed away. When planting beans of any kind, either to prevent washing or for green manuring, don't forget to manure them, as thereby you will get a much greater yield, and as none of the manure is removed from the soil, as the crop is allowed to lie and rot on the ground, it is all made use of eventually by the permanent crop.

A good all-round manure for a bean crop is a mixture of 1 cwt. of sulphate of potash and 4 cwt. of basic superphosphate or finely-ground phosphatic rock to the acre, and, if the soil is deficient in lime, a dressing of not less than half a ton to the acre will be found very beneficial, as all leguminous plants require lime to yield their maximum return both of haulm and pulse. The pineapple plantations require to be kept in a state of thorough tilth, and no weeds must on any account be allowed to grow. If blady grass makes its appearance it must be stamped out, as once it gets established in the rows it is only a short time before it takes control, and the plantation is ruined, so that it can only be brought back into profit by taking out the pines, killing the blady grass, and, after thoroughly and deeply working the land, manuring it and replanting.

The planting of pineapples and bananas can be continued throughout the month, taking care to see that the land is properly prepared and that the advice given in previous monthly notes is followed. Young pawpaw plants that have been raised in the seed bed can be set out now, as also can young passion fruit. Citrus orchards require to be well looked after; the ground must be kept in a state of thorough tilth, and if the trees show the slightest sign of distress, owing to lack of moisture in the soil, they must be given a thorough irrigation if water is available for this purpose. The trees should be carefully examined from time to time so as to note when young scale insects of any kind are hatching out, and when this is noted they should be sprayed with a weak emulsion of a miscible oil consisting of one part of oil in forty parts of emulsion, as this is quite strong enough to kill any young scales before they develop their protective covering. As stated in these notes previously, no oil sprays should be used when the trees are suffering from lack of moisture, as they are then likely to do more damage than good to citrus trees. If scale insects are very bad, and it is important that the trees are sprayed, a weak lime-sulphur spray, or even a soap and tobacco or weak resin wash, will kill the young scales as they hatch out. In the earlier districts a keen lookout must be kept for the first appearance of the mites, which are the direct cause of the darkening of the skin of the fruit known as "Maori." The first indication of the trouble is that when the sun is shining on the young fruit, it appears to be covered with a grey dust, and if the fruit is examined with a good lens it will be seen to be covered with large numbers of small yellowish slug-like insects which are living on the skin. Spraying with sodium or potassium sulphide washes, as recommended by the Department, or with a weak solution of lime sulphur, will destroy these insects and prevent the fruit from turning black. Borers of all kinds should be looked for and destroyed wherever found. Water sprouts, if not already removed, should be cut away. Vines will require careful attention, and the vineyard should be kept in a state of thorough cultivation. Spraying for downy mildew and black spot should be continued, if necessary, as well as sulphuring to prevent oidium.

Fruit fly must be systematically fought whenever seen, and special care must be taken to gather and destroy any early ripening peaches or other fruit that may be infested. If this is done systematically by all growers, as provided by the Diseases in Plants Act, there will be many less flies to attack the later crops of mangoes and other fruits.

Leaf-eating insects of all kinds should be systematically fought wherever seen, by spraying with arsenate of lead, and potatoes and tomatoes should be sprayed with a combined spray consisting of Bordeaux or Burgundy mixture and arsenate of lead, so that diseases such as early blight and Irish blight may be prevented and leaf-eating insects, which frequently cause very heavy losses to these crops, be destroyed.

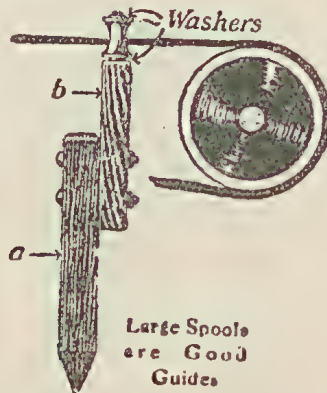
THE GRANITE BELT, SOUTHERN AND CENTRAL TABLELANDS.

Keep the orchards and vineyards in a thorough state of cultivation, so as to keep down all weed growth and conserve moisture in the soil. This is important, as, if a long spell of dry weather sets in, the crop of summer fruit will suffer severely from the lack of moisture. Citrus trees should be irrigated where necessary, and the land kept in a state of perfect tilth. Spraying for codlin moth should be continued, and all pip fruit trees must be bandaged the beginning of the month; further, the bandages must be examined at frequent intervals and all larvæ contained in them destroyed. The neglect to spray thoroughly and to attend to the bandages properly is responsible for the increase in this serious pest in the Granite Belt, and growers are warned that they must pay more attention to the destruction of this pest if they wish to grow pip fruit profitably. Fruit fly may make its appearance in the cherry crop; if so, every effort should be made to stamp out the infestation at once, as, unless this is done, and if the fly is allowed to breed unchecked, the later ripening crops of plums, peaches, apples, pears, apricots, and Japanese plums are bound to become more or less badly infested. Combined action must be taken to combat this, the most serious pest of the Granite Belt, and growers must realise that, unless they take this action and see that careless growers do not breed the fly wholesale, they will never keep it in check, and it will always be a very heavy tax on their industry. Rutherglen bug is another serious pest in this district, and is propagated by the million by careless orchardists. The best remedy for this pest is to keep the orchard clean and free from weeds. Brown rot in fruit should be watched for carefully, and, on its first appearance in a district, all ripening fruit should be sprayed with the sodium sulphide wash.

All kinds of leaf-eating insects should be kept in check by spraying with arsenate of lead, and all grape vines, potatoes, and tomatoes should be kept sprayed with Bordeaux or Burgundy mixture, the former for black spot and downy mildew, and the latter for early and late (Irish) blight.

A ROLLER BELT GUIDE.

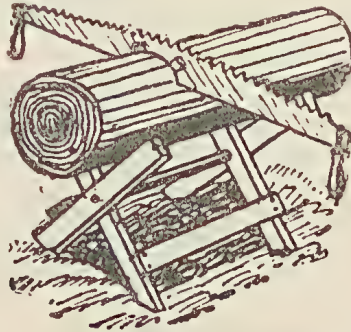
On belt-driven machinery where the load is intermittent, it seems impossible to prevent the belt being thrown off the pulleys frequently without some form of belt guide. The usual form, a piece of board or similar expedient, will wear and fray the edge of the belt. A better plan is to use large spools as guides. These are mounted so as to turn easily on large nails or screws. Where the machinery is out of doors the plan shown in the illustration can be used. Bolted to the top of the



pointed stake, A, is a piece of board, B. This arrangement is used so that we will be able to drive the stake in the ground where required, the spool being mounted on top as shown. To be effective the spools must be so placed as to guide the belt just before it goes on the pulley. They should also be placed far enough away from the edge of the belt so that they do not ordinarily touch it, but come into play only when the belt runs too far to one side or the other.—“Country Gentleman.”

FILING CROSSCUT SAWS.

Large crosscut saws used for sawing logs are, owing to their size, difficult to file when sharpening them without the aid of a vice. Experienced woodsmen employ the slot-and-wedge method of holding the saw, as shown in the drawing, which



FITTING CROSSCUT SAWS.

appeared in "Popular Mechanics." A deep slot is cut across a log or heavy timber and the saw is placed upside down in the cut. One or two small wooden wedges are then driven in the cut to hold the saw securely in position, and it can then be filed readily.

SACK SEWING.

Records for bag-sewing are often claimed in harvest time, and to secure big tallies the method of sewing must be systematised. A recent pamphlet, issued by the Californian Experiment Station, teaches by illustrations a quick method of doing this work, which might be used as a guide to the inexperienced. The equipment consists of a spring-eyed twine needle, with fore part of eye sharpened to cut the loop of the string at the finish; a needle file, to keep the eye sharp, and an oilstone to keep the edges sharp. The skein of twine is cut at one end, and braided loosely,

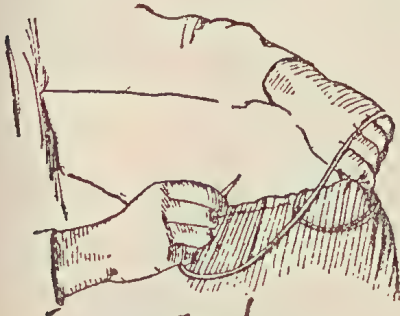


Fig 1

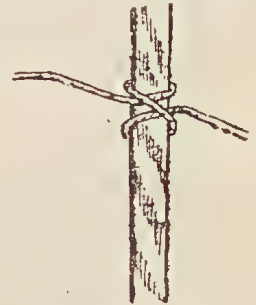


Fig. 2

making strings about 3 feet 9 inches long when doubled. The first two sacks sewn form a seat, and the twine is placed on this with the loop ready to the right hand. The filled sack is placed between the knees with the side seam on the far side from sewer. The instructions run thus:—Bring the edges of the sack nearly together by flattening the sides near the top with the hands, taking care to crowd the grain well into the corners, and to have the left edge slightly higher than the right. Take the threaded needle in the right hand. With the left hand well toward the right side, palm upward, draw the string across it. Roll the left hand toward the body, taking care to pass the fingers over the string, then under it, giving the string a complete wrap around the hand. With the right hand, place the string around the farther ear of the sack by making a quick turn around it in a direction opposite to that of the hands of a clock. Then grasp the ear with the left hand, and allow the string to slide off the hand and make a turn around the ear, thus completing a loose clove hitch (Figs. 1 and 2). Twist the ear firmly in a direction opposite to the clock with the left hand, and draw the string up tight with the right. If properly

done from 4 to 5 inches of the cut end of the string will be unused, and the left edge of the sack will overlap the right. These should be done as a continuous series of motions, and the more quickly the better. Take the first stitch close to ear just finished. Do this by sticking the point of the needle that projects beyond the fingers of the right hand through both edges of the sack just below the finished part or hem. Let go of the blade of the needle with the fingers. Push the needle nearly through with the palm of the hand. Then roll the hand toward the left and over the seam. Grasp the needle again with the fingers of the right hand, and finish pulling it through. As subsequent stitches are being taken, grasp the edges of the sack with the left hand, pull them close together, and tuck the right edge under with the left thumb, keeping just ahead of the needle. Take three stitches in rapid succession. Then tighten the string by pulling it up with the right hand, assisted by the left if necessary. Space stitches evenly, from 1 inch to $1\frac{1}{2}$ inches apart, or so as to have from eight to thirteen stitches in the seam, depending on the fineness of the grain or other material in the sack. With the needle and right hand to the right of the sack, place the left hand, palm upward, under the string. Roll it toward the body, the fingers passing over, then under the string, thus forming a wrap around the hand. Grasp the ear with the fingers of the left hand, and permit the string



Fig 3

to slide off the fingers (Fig. 3). Twist the ear firmly in a clockwise direction as the string is being tightened. Repeat the previous motion, thus forming a clove hitch around this ear also. As the string is being tightened around the ear the last time, hold the needle so as to allow the string to pull against the sharp part of the eye. With a quick backward swing of the right hand cut the string, and at once hang the needle on a loop of unused twine. By practice these motions can be carried out with great rapidity and mechanically.

FLY TRAPS.

The Entomological Division of the Department of Agriculture of South Africa has designed an improved trap, particulars of which are:—

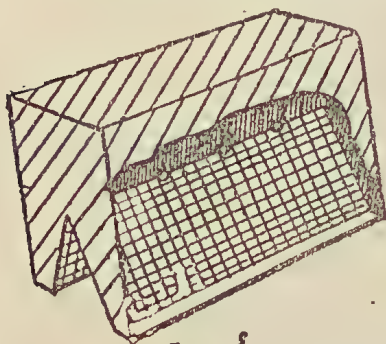


Fig 1

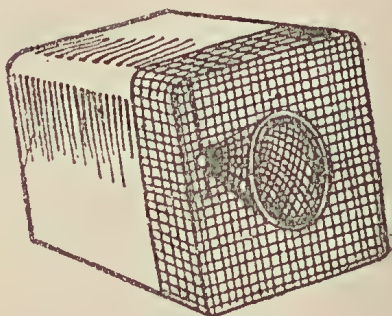


Fig 2.

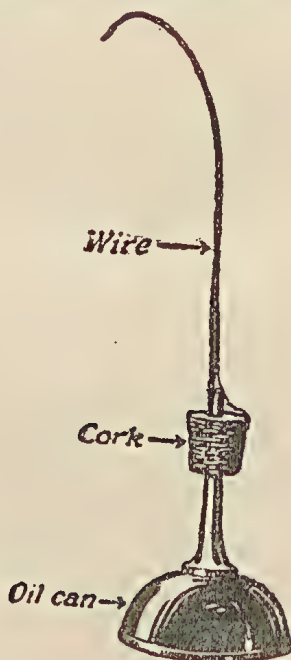
Fig. 1 shows a type of one home-made which any one can make. A handy-size for stable or outdoors is a kerosene case. A smaller box will do for the house. A wedge-shaped opening is cut in each end of the box about 6 inches deep, the base of the wedge being on the top of the box. A piece of fly-wire is nailed over the

opening thus made, being folded to fit the sides of the wedge. Two or three holes, about 3.16 inch in diameter, are placed about 3 inches apart along the ridge of the wedge to allow the flies to enter. A doorway is cut in one side for removing dead flies. The trap is placed with the top on the ground, and baited inside with a lump of stale crust soaked in milk, which is suspended from the roof of the trap. For blowflies the holes should be larger, and a piece of meat used as a bait. Fig. 2 shows a style of trap recommended in New South Wales, and constructed from a petrol tin, with a top of fly-wire in which is inserted a cone-shaped opening with a hole at the apex of the cone. The bottom is watertight, and is filled with a few inches in depth of water, in which is put a piece of meat as bait. The flies crawl through the hole to the bait, and fly upwards to the light to escape, but crawl all over the fly-wire without finding the hole, and eventually fall into the water. The top can be lifted off to clean out the trap.

A] LONG-RANGE OIL CAN.

The ordinary oil can, with its short, straight spout, cannot reach around sharp corners nor squeeze into tight places. Even the can equipped with a longer spout that curves at the tip will not always serve to meet all needs. For example, to oil all parts of automobile springs with an oil can is an impossible task; therefore we make shift to do the best we can with an old brush, swabbing the oil messily over the entire spring with the hope that part of it will reach the points where squeaks are hiding.

But there is a far better way. Take any kind of an oil can. Slip a 1-in. cork over the end of the spout, as shown in the accompanying illustration. Then cut off



THE WIRE CARRIES OIL INTO THE
MOST INACCESSIBLE SPOT.

a piece of stiff, clean wire, about 1 ft. in length. Insert one end of this into the cork close alongside of and touching the spout. The extension spout is completed.

Here is how to use it. Bend the wire into any shape required to reach the point where oil is to be placed. Then "thumb" the can as usual. As long as the general trend of the wire is slightly downward the drops of oil will course down its length in a steady stream to its end. Few will drop off en route. With the curved wire extension, there is no place on automobile springs, no crevice on farm machinery so inaccessible that the small bent wire will not serve to conduct oil to readily. Body squeaks, the bane of the life of every motorist, may be silenced with the simple device in a jiffy. In fact it has any number of everyday uses.—"Country Gentleman."

ASTRONOMICAL DATA FOR QUEENSLAND.

Times Computed by D. EGLINTON, F.R.A.S.

TIMES OF SUNRISE AND SUNSET.

AT WARWICK.

1924.	OCTOBER.		NOVEMBER.		DECEMBER.	
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.
1	5 33	5 50	5 3	6 9	4 51	6 32
2	5 32	5 51	5 2	6 10	4 51	6 33
3	5 31	5 51	5 1	6 11	4 50	6 34
4	5 30	5 52	5 0	6 12	4 50	6 35
5	5 29	5 52	5 0	6 13	4 50	6 36
6	5 28	5 53	4 59	6 13	4 50	6 36
7	5 27	5 53	4 59	6 14	4 50	6 37
8	5 25	5 54	4 58	6 14	4 51	6 37
9	5 24	5 54	4 57	6 15	4 51	6 38
10	5 23	5 55	4 57	6 16	4 51	6 39
11	5 22	5 55	4 56	6 17	4 52	6 39
12	5 21	5 56	4 56	6 18	4 52	6 40
13	5 20	5 56	4 55	6 18	4 52	6 40
14	5 19	5 57	4 55	6 19	4 53	6 41
15	5 17	5 58	4 54	6 20	4 53	6 41
16	5 16	5 58	4 54	6 20	4 53	6 42
17	5 15	5 59	4 53	6 21	4 54	6 42
18	5 14	6 0	4 53	6 22	4 54	6 43
19	5 13	6 1	4 52	6 23	4 55	6 43
20	5 12	6 1	4 52	6 24	4 55	6 44
21	5 11	6 2	4 52	6 25	4 56	6 45
22	5 10	6 3	4 52	6 25	4 56	6 45
23	5 9	6 3	4 52	6 25	4 57	6 46
24	5 9	6 4	4 51	6 27	4 57	6 46
25	5 8	6 4	4 51	6 28	4 58	6 47
26	5 7	6 5	4 51	6 28	4 58	6 47
27	5 7	6 5	4 51	6 29	4 59	6 48
28	5 6	6 6	4 51	6 30	5 0	6 48
29	5 6	6 7	4 51	6 31	5 0	6 49
30	5 5	6 7	4 51	6 31	5 1	6 49
31	5 4	6 8	...	...	5 1	6 49

Phases of the Moon, Occultations, &c.

The times stated are for Queensland, New South Wales, Victoria, and Tasmania.

6 Oct. (First Quarter 12 30 a.m.

13 " O Full Moon 6 21 a.m.

21 " D Last Quarter 8 54 a.m.

28 " ● New Moon 4 57 p.m.

Perigee, 3rd and 30th October { 3 6 p.m.
12 12 a.m.

Apogee, 18th October .. 6 18 p.m.

On the 10th October, at 8:17 p.m., Uranus will be in conjunction with the moon about three times the moon's diameter below it. This should be observable in binoculars.

On 23rd October, at about 10 p.m., Regulus will be occulted by the moon at Thursday Island, but not at Cooktown or Cairns, where Regulus will appear just above the edge of the moon; further south the distance between Regulus and the moon will appear greater.

On the 26th October, at 1:0 p.m., Mercury will be in superior conjunction with the sun—that is, on the far side of its orbit beyond the sun, where it will be quite invisible. Venus will be a morning star, and Saturn, Jupiter, and Mars will be visible in the evenings during this month.

4 Nov. (First Quarter 8 18 a.m.

11 " O Full Moon 10 0 p.m.

20 " D Last Quarter 3 38 a.m.

27 " ● New Moon 3 15 a.m.

Apogee, 15th November, 11:0 a.m.

Perigee, 27th November, 10:36 p.m.

Venus, still the most brilliant morning star, will be about five degrees west of Spica (the principal star of Vergo) on the 15th; Mars on that date will be apparently amongst the smaller stars of Aquarius, setting about half-past 1 in the morning. Jupiter will be apparently amongst the stars of Scorpio about 15 degrees to the north-east of Antares. Saturn will be visible only in the east, rising about an hour before the sun.

3 Dec. (First Quarter 7 10 p.m.

11 " O Full Moon 5 3 p.m.

19 " D Last Quarter 8 11 p.m.

26 " ● New Moon 1 45 p.m.

Apogee, 12th December, 6:36 p.m.

Perigee, 26th December, 11:12 a.m.

Mercury will be at its greatest elongation east of the sun on the 10th, and will rise and set one hour and twenty-four minutes after the sun on the 15th, apparently amongst the stars of Sagittarius. Venus will still be the brilliant morning star, rising about 2 a.m. on the 15th, apparently among the stars of Libra; Mars, having apparently reached the constellation Pisces, will set soon after midnight on the 15th. Jupiter will not be so well situated for observation, and will be lost in the sun's rays towards the end of the month. Saturn, as a morning star, will rise about half an hour before Venus in the middle of this month.

For places west of Warwick and nearly in the same latitude, 28 degrees 12 minutes S., add 4 minutes for each degree of longitude. For example, at Inglewood, add 4 minutes to the times given above for Warwick; at Goondiwindi, add 8 minutes; at St. George, 14 minutes; at Cunnamulla, 25 minutes; at Thargomindah, 33 minutes; and at Oontoo, 43 minutes.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night; when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

[All the particulars on this page were computed for this Journal, and should not be reproduced without acknowledgment.]

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QUEENSLAND AGRICULTURAL JOURNAL

VOL. XXII.

NOVEMBER, 1924.

PART 5.

Event and Comment.

The Current Issue.

Readers will find this month's Journal a very interesting number. Some further notes on the acidities of our sugar soils are contributed by Mr. H. W. Kerr; Mr. G. H. Hardy also has a useful note on some parasites of the blowfly. Two valuable fodder trees are described by Mr. White, and Mr. Shelton has added a historical note on the pig to his regular feature, which this month covers a description of the Gloucester Old Spot pig, a breed new to Australia. The activities of the Main Roads Board are specially featured, and in connection with which some very fine plates are reproduced through the courtesy of the Board and its secretary, Mr. J. E. England. Among interesting reprinted matter is an article on the bases of arable farming, and an account of some research work in respect to a peculiar ear disease in pigs. A special set of plates, sent to us by Mr. H. W. Mobsby, the Queensland officer at the Empire Exhibition and also of this Department, depict the effective staging of Australian products at Wembley. Usual features are well supported with informative matter, and generally the November Journal will find ready appreciation.

A Fruit Fly Week.

Something novel in State education was initiated in the course of the month in the State schools in the Stanthorpe district in the form of a "Fruit Fly Week." This was part of a scheme formulated by Professor E. J. Goddard, D.Sc., of the Queensland University, in his fruit fly campaign, and in respect to which he is receiving the whole-hearted support of the Department of Public Instruction. The basic idea of the scheme is that when a community knows the life history and habits of a particular pest, it is better armed for its extermination. This year a strong co-operative effort is being made by the fruitgrowers, assisted by the University and the Agricultural and Educational Departments, to prevent any serious fruit fly infestation in the Granite Belt. At every school in the district a special daily lesson was given on the fruit fly, its life history, the meaning of the campaign, and recommendations for checking any local invasion. Specimens and a treatise on the subject were provided for each teacher. In continuance of the good work special weekly lessons dealing with particular phases of the campaign will be given throughout the fruit season.

Minister's Efforts Appreciated.

The Stanthorpe District Council of Agriculture has forwarded the following resolution which was adopted unanimously at its last meeting on 1st November:—
 "That this meeting of the Stanthorpe District Council expresses its sincerest appreciation of the great assistance rendered to the fruitgrowers of the Granite Belt by the Hon. W. N. Gillies, Minister for Agriculture, in granting the several requests made by Professor Goddard for the purpose of carrying out the fruit fly campaign. We fully realise that, at a time when it is necessary for the Government to practice rigid economy, Mr. Gillies' action in incurring new expenditure to help in the control of the fly is deserving of the best thanks of the fruitgrowers, not only of this district but of Queensland."

Cotton Experimental Plots—Entomological Studies.

The Cotton Section of the Agricultural Department has been feeling the want of plots where experiments may be carried out under typical conditions in the Lockyer, and arrangements were made recently with the Agricultural College authorities to carry out definite experiments on the college farm this season. A single variety of seed only is being grown—the Acala—which is now being thoroughly tried out under Lockyer conditions. The experiments that have been devised are ratoon and standover versus annual; different methods of pruning ratoon cotton; fertiliser tests; and time of thinning experiments. In addition to this, a number of pure progenies of the Acala variety, which were selected from single plants last year, are being grown for further observation, and it is hoped by this means that strains of Acala, particularly adapted to local conditions, will be obtained. In addition to the foregoing, the cotton entomologist will use these plots for his experiments and observation work, and cages have been erected over different plots. The ratoon plots at the present time are affording an interesting field of investigation for the entomologist, and it appears probable that in some of these plots in which new bolls already have formed, pests have discovered an abundant food supply, which will allow them to carry over and increase in numbers preparatory to an invasion of the main annual crop later on in the season. The indications are, however, that one of the chief drawbacks to ratoons in Queensland will be this question of carrying over the insect pests from one season to another, and the situation from this point of view will have to be very carefully studied.

The Banana Duty.

At a sitting of the Commonwealth Tariff Board in Brisbane, in the course of the month, the case for the retention of the duty on bananas was further considered. The Minister for Agriculture and Stock (Hon. W. N. Gillies) is a strong and unrelenting advocate for a continuance of the duty, and an unanswerable case was presented to the Tariff Board by his departmental officers. Bananas are now being produced in Queensland in quantities sufficient to supply the whole Australian trade in this fruit. In our far Northern province alone, banana production could be developed to such an extent as to exceed all Commonwealth requirements. The fact that most of the diseases and pests affecting bananas produced in Queensland were introduced in oversea importations is in itself convincing evidence of the need of the protection of this important industry. In this State banana-growing is a white man's industry, growers pay wages in accordance with the demands of a white man's living standards, and it has proved peculiarly adaptable to effective repatriation of ex-service men. It is also an industry peculiarly suitable for the industrious man possessed of only small capital, and in that respect is proving one of our best land settlement agencies. To reduce the tariff under which banana-growing has become a more-or-less stabilised Australian industry would be a woefully short-sighted act, and no authority with any claim to statesmanship is likely to consider seriously any proposal to that end. The chairman of the Board evidently appreciated the vigilance of those interested in the industry and commended their initiative and appreciated the strength of the case that they submitted.

Agricultural Scholarships.

Applications are being received from all parts of Queensland, on behalf of boys attending both State and secondary schools, for the scholarships offered by the Department of Public Instruction and tenable as from the beginning of the coming year at the Agricultural High School and College at Gatton. Forty-five scholarships will be awarded; thirty tenable in a junior course, and fifteen at a senior course in agriculture. The junior scholarships will be awarded to successful candidates at the last State scholarship examination who may apply for them; but should there be an insufficiency of these candidates, the balance of the scholarships will be awarded to successful candidates at the high school entrance examinations this month. The junior scholarships entitle the holders to three years' residence and tuition. The senior scholarships are limited to successful candidates at this year's junior public examination. The course of instruction will be thoroughly practical and scientific, and will also cover a sound general education.

Bureau of Sugar Experiment Stations.

FIELD REPORTS.

The Northern Field Assistant, Mr. E. H. Osborn, reports to the Director, Bureau of Sugar Experiment Stations (Mr. H. T. Easterby), under date 27th October, 1924:—

Cairns District.

When this area was inspected about the middle of September the two local mills were steadily making good progress with their very large crops of cane, and were getting through some big crushings.

Hambledon had just finished a remarkably good week, when its week's figures ran into 6,109 tons. When the size of the mill is considered it is a wonderfully good performance. Up to time of writing, in both mills the percentage of burnt cane was below the average.

From Freshwater some very heavy yields per acre were harvested, as the following figures attest:—

Judas, C.—35 acres of 14 months' old Badila, 72 tons per acre (plant).

Mason, A.—6.6 acres, about the same age, 61 tons per acre (plant).

McManis and Painter.—24 acres, about the same age, 50-60 tons per acre (plant).

Mann and Roach.—Plant, 61 tons per acre; first ratoons, 40 tons per acre; second ratoons, 27 tons per acre.

At McManis and Painter's some December-cut ratoons look good enough for a 30-ton crop.

Edgehill.

At this small cane centre some fine cane was noticed, particularly upon Mr. Fleming's and Mr. Vesey's farms. The former had just completed harvesting some 937 tons off 31 acres, portions of which were first and second ratoons. His best cane was a splendid block of H.Q.458. This at ten and a-half months old cut at the rate of 55 to 60 tons per acre. Ratoons are also showing a fine growth. Quite a number of adjoining growers have planted blocks of this cane. The soil here is of a reddish and slightly stony nature, and evidently suits this variety.

Mulgrave Mill Area.

This area is going ahead very rapidly, the township spreading out in several directions at a great rate, and its general air of prosperity is most marked. The mill is doing fine work, and the large crop is cutting well up to the earlier estimates. Harvesting conditions have certainly improved vastly, and the cane going through the rollers is far fresher than formerly.

Generally, the whole area looks extremely well, and some beautiful paddocks of young plant cane were noticed. In the writer's opinion the young plants, both in quality and quantity, are very superior. With the present weather conditions prevailing, next year should be a mighty big one for the Mulgrave.

One very pleasing feature of the area was to see how remarkably green and healthy the Meringa lands were looking. Grubs had not done any damage, and old residents said that the prospects for next year there were far brighter than they had been for very many years.

Of varieties of cane locally grown, probably 70 per cent. is Badila, with, say, 20 per cent. D.1135, and 10 per cent. of other varieties. Very little borer damage seemed to have been caused this year, and rats were not very troublesome.

Diseases.—In the Hambledon area Leaf Scald was noticed on several farms at Waree and near Edgehill. At the latter place a block of second ratoon Badila was

noticed to be heavily infected. Cane from this paddock was being cut for plants when the writer came along; in fact several stools showing the disease very strongly were within a few yards of where the plant cutters were and who did not know the disease. In two of the cases the particular parts of the paddock where the disease showed up were of a low-lying, badly drained nature, but on the other the drainage was all right and the cane well cultivated.

In the Upper Freshwater area, Leaf Scald was noticed on three of the farms visited. In two of these cases paddocks of second ratoon (Badila) that had been rather neglected showed a good deal of the disease. In two other paddocks young plant (N.G.15) showed the characteristic leaf markings in places, and upon inquiry I was told that in each case the blocks from which the plants came were also affected.

In the Mulgrave area second ratoons (N.G.15) were badly affected in places. At Aloomba, adjacent to the river, first ratoons (N.G.15) were found to be heavily diseased, and symptoms were also noticed in a plant crop now nearly ready to be cut.

With such examples in mind it is worth remembering that Mahona, one of the principal canes upon the Richmond River, had to be discarded a few years ago from this cause, and were such a thing to happen to Badila the consequences would be serious for Northern canegrowers. It therefore behoves every grower to be exceedingly careful in seed selection.

Mossman Area.

When this area was visited early in October the general outlook was most promising. Crushing was proceeding at a very satisfactory rate and the management hoped to finish the estimated crop of 80,000 tons before Christmas. In passing, it might be mentioned that this year's crop is the largest to be handled by the mill since 1906. During the past few years the tonnage has been slowly but surely increasing, and with the larger area of new land now being put under, next year's figures should easily exceed the present season's.

One of the principal new areas is Whyanbul Creek, at Saltwater. It is intended to lay down some $3\frac{1}{2}$ miles of permanent line to connect this area. There are about 700 acres of land here, about 150 acres of which are now being planted.

Quite a large area of this is new land, whilst a portion of the other has not been cropped for many years. All of it looks likely cane land. Another portion of the district that has grown considerably during the past two years or so, is Cassowary. Quite a few new suppliers are established, and some very heavy crops of Badila were being harvested from some of the small, though rich, pockets. Saltwater area proper also looks remarkably well, the farm of Messrs. Phemister, Coultard, and Co., being a credit to them. Right throughout the district good strikes of young plant cane were seen, whilst the recently-cut ratoons compared more than favourably with any seen elsewhere. This, no doubt, is partly due to the favourable weather conditions experienced during August, when a fall of 6.57 in. was recorded.

Diseases.—So far this district has been fairly free from disease. Leaf Scald was noticed to a rather marked extent in a block of Green Goru (N.G.24B), third ratoons, and to a lesser extent in an adjoining paddock of second ratoons of the same variety. An odd stool of twelve months' old plant B.147 was also seen, and a stool or two of first ratoons, H.Q.426, recently cut, was also showing the symptoms. In another place a stool of second ratoons, D.1135, was similarly affected. In some old B.147 ratoons, Leaf Stripe was also observed. Both these diseases are capable of causing great damage, and growers would be well advised to be extremely careful in seed selection.

Cane Analysis.—The following analyses in connection with several new varieties were very kindly supplied by Messrs. Crees Brothers from their Boondarra Farm:—

Plant cane, twelve months old, grown upon low land, cut 30th August:—

Cane.	C.C.S.	Weight of stick. (lbs.)	C.C.S. in stick. (lbs.)
E.K.1	13.64	5.35	.716
Nanemo	17.18	5.09	.859
H.Q.458	14.8	9.25	1.369
E.K.28	17.57	5.57	.966

Second ratoons, eleven months old, grown on high land, cut 13th August:—

Cane.	C.C.S.	Weight of stick. (lbs.)	C.C.S. in stick. (lbs.)
H.Q.458	14.22	4.0	.568
E.K.28	15.66	5.0	.783
H.109	13.25	6.5	.861
H.K.426	16.25	5.0	.812
Q.903	11.42	5.5	.628

While in the area, many inquiries were made for Q.813 and E.K.28, for the returns of both canes have been consistently good. Referring to the former a block of third ratoons is now being harvested, cutting probably 17 or 18 tons per acre. Last analysis of this gave a c.e.s. of 14.8, whilst the mill average for the same period was only 13.2.

A fine plot of young plant H.109, and also a plot of Gingor, was seen upon Mr. W. S. Johnston's Drumsara Estate. The former looked extremely vigorous, and was making very rapid growth.

Since my last visit a large number of new tractors have come into operation, and generally the district is most promising.

SOME NOTES ON THE ACIDITIES OF QUEENSLAND SUGAR SOILS.

By H. W. KERR, B.Sc., Sugar Soils Travelling Scholar.

In the June number of the Journal were published some introductory remarks on soil acidities. The writer has since taken advantage of a tour through some of our Queensland sugar districts to investigate further this important question, and has examined a considerable number of samples representative of the various sugar soils.

The results present some very useful information and apparently explain a number of causes of infertility which have not, hitherto, been clearly understood; on the other hand, they throw some light on the reason why many of our soils, in spite of the presence of considerable amounts of acidity, do not respond to liming. This latter class is represented by the red volcanic soils of the Bundaberg and Bingera areas, which are found to be benefited but little, if at all, by even heavy applications of lime. Further results confirm what was previously suggested, that the acids in these soils are organic in nature, and become toxic only when the soils are badly drained and poorly aerated.

The Mackay district soils show, on the whole, an absence of any high degree of mineral acidity, and most of them are naturally well supplied with lime. One exception to this statement stands out in the case of a curious yellowish-brown subsoil, which occurs in the Mount Jukes area. In many instances here the surface soil is only a few inches in depth, and the subsoil is brought to the surface even by shallow ploughing. When turned up damp it has the appearance of a heavy clay, but when once air-dried and remoistened the clods disintegrate readily, yielding a free soil. This material is the ultimate decomposition product of the diorite rock which is abundant in the area. It is very rich in grains of ferruginous minerals, and flakes of bleached biotite mica are plentiful. An analysis shows that the subsoil is very well supplied with lime, and contains about an equal amount of magnesia. It is exceptionally rich, both in total and available phosphoric acid; on the other hand, it is very deficient in potash. The most striking feature, however, is the high value found for the mineral acidity, which is due almost entirely to soluble aluminium salts, the presence of which is very harmful to plant life when in excess of a certain small percentage.

The farmers in this district have been troubled very much with cane grubs, and as a consequence plant only D.1135 variety to ensure a crop, but it is very probable that the poor progress of some of this cane is not altogether due to the grub attacks, but also to the toxic effect of the soluble aluminium salts. Reference is made here, chiefly of those farms on hillsides, where the surface soil is very shallow, and farmers are advised to be very cautious about turning up more than a slight amount of this subsoil with each ploughing. With judicious cultivation it is quite possible that the condition of this material will be steadily improved even without applications of lime, as the soil is already well supplied with this constituent; for rapid improvement, however, free use of lime is absolutely imperative.

Passing on to the soils of the Burdekin Delta, we become acquainted with the dark alluvial loams and sandy loams, which are, on the whole, extremely fertile; when we remember that this is a district of low rainfall, and, as a consequence, the leaching of available plant foods from the soil is at a minimum, we readily understand the natural richness of these lands. The acidities of these soils, generally, is very slight; indeed, in several instances, the reactions of the soil were distinctly alkaline.

The Innisfail, South Johnstone, Mourilyan, and Babinda districts have very little in common with any of the soils encountered south of Townsville. These are districts of very heavy rainfall, and the soils are continually subjected to excessive leaching of soluble soil constituents. A study of the analysis of a typical soil from any of these districts, shows that, on the whole, the soils are very deficient in lime and contain a rather poor supply of humus. Cultivation and the removal of several heavy crops from some of these lands has still further depleted the lime and humus content and allowed the development of acid mineral substances in the soil. One farm in particular, on the Innisfail Estate, contained such a high percentage of these acid compounds that a cane crop of only ten tons per acre was produced annually, and this from an alluvial loam in a locality reckoned to contain the best soils in the district. This is not an isolated case, for many crops were found on examination to be suffering from the same causes, although, perhaps, not to the same extent.

The remedy for such a soil is to give the land heavy applications of lime, preferably followed by a dressing of superphosphate, and the humus content increased by the ploughing in of a green manure crop such as Mauritius beans.

It might be stated that all the soils in these districts would benefit very largely by liming. It is a well-established fact that artificial fertilisers cannot be expected to give returns on soils deficient in lime. For instance, when ammonium sulphate is applied to a crop, the "ammonium" portion is ultimately absorbed by the roots, leaving behind the sulphuric acid, which then removes an amount of lime equal in weight to the ammonium sulphate applied, provided the necessary lime is present in the soil; if this is not the case, it remains to increase the already excessive soil acidity.

A common feature in the canefields of these districts is the presence of a partially sterile pocket or "poison patch," as it is commonly known, where the cane grows very poorly or not at all, whilst the surrounding crop is very healthy and showing vigorous growth. Careful inspection shows that the soils are apparently identical, and the cause cannot be attributed to any defect in the substrata. The writer was led to believe then, that the sterility was a chemical nature, and an investigation was made of several of these patches, by comparing the acidities of the defective soils with those of the adjacent portions of the field carrying good cane. In every instance it was found that the poor soil was excessively high in mineral acidity, due almost entirely to soluble aluminium salts. The presence of these latter seems to give rise to poor root development and consequent stunting of the cane, while in extreme cases the sets were completely rotted out.

In one field at the South Johnstone Sugar Experimental Station, four of these pockets were observed. On one, the cane (N.G.15) was very stunted, having only two or three sticks to the stool, and these about 18 inches long and $\frac{3}{4}$ inch in diameter. The least affected patch was certainly backward, by comparison with the remainder of the crop, which would cut out at over 30 tons to the acre. The remaining pockets carried cane showing growth intermediate to these two. The values of the factor "K" (which may be called the "liming coefficient") for these four plots is given in the following table, and it is seen that the higher value of "K" for the soil the more seriously the cane is affected.

Soil No.	"K" Value.	Remarks.
1	83	Least affected plot.
2	115	Growth intermediate to 1 and 3.
3	120	Growth intermediate to 2 and 4.
4	204	Cane in worst condition.

Average for the whole block—"K" 46.

The above is selected as a typical example, and was found to obtain, without exception, when any comparisons were made.

A study of the results of test on the alluvials of the Innisfail and South Johnstone districts shows that a value for "K" of over 60 indicates the absolute need of the soil for lime, and this is advantageously followed by a dressing of some phosphatic manure, such as superphosphate. Of course, this "critical" value of "K" will vary for different soil types, being higher on rich and lower on poorer soils.

It must not be concluded from the above remarks that all sterile pockets found in otherwise productive canelands owe their infertility to this cause; similar phenomena are common in many others of our cane districts, but it is most improbable that a general explanation will apply in all cases. Until such times as a closer investigation is made in the Southern districts the above corrective treatment is recommended only for the soils in the humid cane areas of North Queensland.

It is regretted that a more extensive soil examination was not possible, due to the limited time and facilities at the writer's disposal, but, as the acidity tests are being continued by the Agricultural Chemist on all soils submitted for analysis, we may, at an early date, be able to make some broader generalisations on this very important soil problem.

The following are the results of some tests made on soils of the Innisfail District:—

Soil No.	Locality.	"K" Value.	Remarks.
5	Mundoo ..	8	Red volcanic ridge. Cane growth good.
6	do. ..	19	Creek, flat alluvial, carrying heavy crop of 7R 428.
7	do. ..	39	Alluvial flat, fair crop.
8	do. ..	73	"Poison" patch.
9	do. ...	40	Adjacent to soil No. 8, but cane shows much better progress.
10	Goondi ..	Nil	Red basaltic ridge.
11	do. ...	4	Alluvial flat, carrying good crop.
12	do. ...	Nil	Alluvial flat.
13	Innisfail Estate	95	Crop only about ten tons per acre.
14	Mourilyan ..	62	Alluvial soil, carrying poor crop.
15	do. ...	18	Red loam, poor cane crop.
16	Silkwood ..	166	"Poison" patch.
17	do. ...	112	Sandy soil, does not grow cane.
18	Japoon ..	Nil	Alluvial soil, carrying good crop.
19	do. ...	61	"Poison" patch, old land.
20	El Arish ..	13	Good land, producing forty-ton crop.
21	Harvey's Creek (Babinda)	85	Crop very poor.
22	Babinda ..	90	Cane backward in growth.

CREAM CAN ECONOMY.

All dairy farmers should see that their milk and cream cans are in a condition fit to contain these products. It is not sufficiently recognised that old, rusty, broken, or dented cans may be responsible for a large percentage of the objectionable taints that occur in cream and milk. It has been conclusively proved, however, that this is so, and it is, therefore, folly for farmers to continue to use cans which for any reason may be regarded as insanitary.

A rusty surface on the inside of a can is one of the chief troubles, but one which in many cases can be very easily remedied by re-tinning. When cream or milk comes in contact with rust patches, it is very likely to develop a metallic or a tallowy flavour, both of which are very objectionable taints for the butter-maker. If the rust is allowed to remain for any length of time, the surface will become badly pitted, and traces of milk and cream will lodge in the uneven face, with the result that harmful bacteria will rapidly develop and the fresh cream will be immediately infected and more than likely badly contaminated before it can be treated at the factory.

Cans which are badly dented, especially round the shoulders, it is often almost impossible to clean thoroughly without a great amount of trouble, and they should, therefore, be attended to immediately they are damaged.

Broken necks and lids are objectionable, as they allow stale cream and milk to collect and contaminate the fresh cream.

THE BASES OF ARABLE FARMING.

BY J. G. STEWART, M.A., B.Sc.*

Man's instinct to live was the compelling force behind his first attempt at farming, and the winning of food from the soil is still the primary object of the farmer's business. Modern practice has been gradually evolved from the simplest beginnings. Originally a hunter, and, later, a herdsman, man early realised what some of us seemed to have forgotten in 1914, that the greatest and most certain supply of food was producible by settling down and tilling his patch of land. The ranging stockman developed into a tiller of the soil.

Corn was being grown in Britain at the time of Cæsar's arrival, 55 B.C., and cultivation was largely extended and improved during the Roman occupation. Following the departure of the Romans in 410 A.D., there arrived, with their flocks and herds, the Angles, Saxons and Jutes, who settled in townships and marked off sufficient land to satisfy their common needs. Owing to internal dissension and foreign invasion, progress along these lines was slow and the manorial system was evolved. Men worked under the protection of a lord. Out of this grew the folding system, for the sake of the manure, a method which still obtains. Folding, together with marl or chalk, was one of the fundamentals of early arable cultivation. Corn yields were low, round about two sacks per acre, at the end of the thirteenth century. There were no potatoes, no root crops, and no clover as now grown.

About the time of Henry VIII. the system of landlord and tenant had taken shape and progress became more rapid. Large tracts of land were enclosed, and by the seventeenth century England had adopted a system of farming which, in a more developed form, is practised to-day.

The change from strips of land cultivated in common to enclosed fields, controlled by one man, was an important step in agricultural advancement. Men began to assert their individuality, to look ahead and to do some fundamental thinking. They were no longer satisfied with two corn crops and a bare fallow. Cromwell's soldiers, marching through East Lothian for the battle of Dunbar (1650), were much impressed by the luxuriant corn crops and the absence of bare fallows.

Horse-hoeing Husbandry and Rotations.

Sir Richard Weston, writing in 1651, advocates the growing of sainfoin, clover, trefoil, and lucerne. In 1701 Jethro Tull invented a drill for sowing corn and other crops in rows, so as to provide for horse-hoeing in between, and in 1726 we find Richard Bradley urging farmers to adopt arable cultivation on a larger scale and recommending a rotation of barley, turnips (eaten off by cattle or sheep), peas, and wheat. He further states: "This land may at any time be laid down for grass by sowing it with ryegrass and clover."

About the middle of the eighteenth century Lord Townsend introduced into Norfolk the rotation which is still known as the Norfolk four-course, and is the basis of all cropping systems in vogue in this country to-day.

The introduction of turnips was a notable advance. They superseded bare fallows on all but the heaviest soils by providing suitable facilities for cleaning the land, supplemented hay and straw as winter food for stock, and helped in the making of dung. By interposing clover between the corn crops the land was, at small cost, enriched in nitrogen—usually the most potent factor in increasing soil productivity; and as a result of the change more labour could be employed and distributed more evenly and regularly throughout the year.

Milestones of Progress.

Towards the end of the eighteenth century great strides had been made in the improvement of British live stock, and, a little later, the introduction of the system of under-drainage was yet another milestone on the road of progress.

The great industrial development that marked the opening of the nineteenth century, and the establishment of flourishing manufacturing towns, increased the demand for everything the farmer produced and led to the improvement of means of communication.

*In "The Farmer and Stock-breeder" (U.K.), 2 June, 1924.

In 1893 the Government took the first step towards getting farmers a scientific education by employing Sir Humphrey Davy as lecturer on agricultural chemistry, and in 1843 Sir. J. B. Lawes founded Rothamsted and practically initiated the use of artificial manures in England.

Simultaneously with these developments farmers had, to a great extent, helped themselves by inventing and improving farm machinery, and superimposed on all of the foregoing considerations, fiscal arrangements (as, for example, the Corn Laws) were, as now, of fundamental importance in determining farming practice.

The Nation's Food.

In a recent pamphlet on the "Possibilities of British Agriculture," Sir Henry Rew and Sir John Russell supply figures which, taken as a whole, indicate that about half the nation's food is grown in Great Britain; that certain commodities (*e.g.*, milk potatoes, vegetables, and certain fruits) are almost wholly produced in this country; and that, on the other hand, our production falls short to the extent of 75 per cent. to 55 per cent. in respect of such articles as wheat, meat, eggs, and dairy produce. Of the latter group the market value of wheat, in particular, is governed by world prices, and the only alternative for the British farmer is to surpass his competitor in yield and go for the heaviest cropping variety. In meat, eggs, and dairy produce there would appear to be room for considerable expansion.

Let us, then, examine arable farming in the light of these facts and the present economic conditions.

Rotation: The Pivot of Arable Farming.

The pivot of arable farming to-day is the rotation—regarded too often, it may be, as immutable, like the Laws of the Medes and Persians. While the main reason for an alternation of crops is an economic one, a particular rotation is apt to remain stereotyped, irrespective of changes in the economic situation. The most productive farmers have aimed at getting the fullest return possible from the land without producing exhaustion; one crop follows another in quick succession. . . . The particular practice adopted, however, is usually regulated by custom, the result of years of experience. A new-comer to a district should not lightly disregard established practice; at the same time it does not always follow that recognised custom is the best guide. . . .

Keeping of Accounts.

One of the drawbacks of farming is that ordinary financial accounts—even where these are kept—do no more than show the gross returns from corn, cattle, or sheep; they give no information regarding the profit or loss on individual items. Without going so far as to suggest that all farmers should keep cost accounts, I do say that every farmer should keep at least a sufficient record of his transactions to enable him to satisfy the Inland Revenue authorities—a simple valuation at the beginning and end of the year, and statement of income and expenditure classified under the principal headings. The only other essential is a paged diary with cash columns in which should be jotted down, regularly, particulars of the day's work and the financial business transacted. By sitting down to the work the farmer would be able to determine with approximate accuracy the profits or losses on the various departments. If neighbouring farmers would analyse and compare their results a lot of valuable information would accrue to all concerned.

Bookkeeping is probably the most urgent need of the average farmer at the present time. . . . Bookkeeping will not, at the outset, enable a farmer to convert a loss into a profit, but it will, at least, stimulate his mental processes and arouse that spirit of investigation and inquiry, which is the first step in progress and development.

Extension of Temporary Grass.

It was adversity that put the Danes on the track of their present highly organised and efficient system of farming. Similarly the depression of the last quarter of the nineteenth century was responsible for an alteration in the Scottish system of tillage, which still holds good and has weathered successfully the economic disturbances of the past few years. The four-course rotation was converted to a six- or seven-course one by extending the period of temporary grass to two or three years. This had the effect of reducing the labour bill while maintaining a high individual rate of

pay and a high total output of corn. It further effected economies in manures and led to the development of stock-raising in the poorer and more isolated districts, and of arable dairying in the vicinity of towns. . . .

Under every system of farming a certain complement of labour is necessary, and it is the first principle of success that labour should be fully and usefully employed at all seasons. Hence, it is probably unprofitable as well as undesirable that arable land under almost any set of circumstances should be reduced beyond a certain limit.

Practice Determined by Prices.

In considering measures that might be taken to mitigate the present economic stress, it is useless to ignore the fact that practice must be determined by prices. We may all agree that the best thing for the country is to maintain or enlarge the area under tillage. We must, however, count the cost. Tillage needs much capital and involves heavy risks, and one of the chief disabilities of the average farmer is the lack of ready access to capital. What is to be done? A committee of German specialists, reporting to their Government in 1915, estimated that the expansion of German agriculture in the past was due to—

The use of artificial manures	50 per cent.
The cultivation of more prolific crops	30 per cent.
Other measures	20 per cent.
	<hr/> 100 per cent.

Development along these lines is a matter of continued evolution and education—education correlated with practice. In the past, education has aimed chiefly at increasing production without much regard to cost. Farmers and educationists must, alike, get down to £ s. d. It is of little real value to know that the use of artificial manures or of a particular variety will increase the crop beyond that of standard practice. Unless the cost of the basic crop is known one cannot say that the innovation is profitable. Farming is a business to be judged by the financial results. Just, however, as recording of food and milk in the case of dairy cows has shown that appreciable economies can be effected, so cost records in regard to crops would stimulate farmers to investigate possible sources of leakage. . . .

SHEEP—UNIFORMITY OF TYPE AND CHARACTER.

In making up the flock, be it for purebred breeding or for commercial breeding, it is essential that the owner should first of all strive to obtain a flock of uniform type and character. The reason is obvious; from such a flock the lambs are uniform, and afford greater attraction to the purchaser, whether they be sold for stud purposes, or for commercial purposes or for slaughter. Eliminate every ewe that gives any indication of coarse breech wool, and bad symmetrical conformation, for such produce, generally speaking, lambs of a similar character. The butcher, who becomes the final purchaser, naturally gives preference to the more symmetrical carcase, and the one that has the larger proportion of the more valuable parts, as compared with the inferior joints.

The selection of the sires for the flock is, of course, a matter of very vital importance, and we would strongly urge upon every flockowner who is contemplating purchasing a sire or sires for his flock, only to do so after a most careful and critical examination. The nearer perfect the individual sire is the better, and the greater will be its produce. In many districts, it is the practice for the commercial flockowner to run some six or more rams together in his flock. In such cases, the better course of procedure is to purchase the whole of the sires from one flock. There is a greater likelihood of getting a uniform lot of lambs by so doing. Unfortunately, our past experience has time after time shown an utter disregard for this. We have known large flockowners buy from as many breeders as they require rams, and year after year we have heard the same remark: "My lambs are not as they should be; they are all of different character." How can it be otherwise? We urge this, as we have urged it in many years past; either the purchasing flockowner should go out of the business, or secure the whole of his run of rams or ram lambs from one individual flockowner.—
"The Farmers' Express."

A BLOWFLY AND SOME PARASITES.

By G. H. HARDY, Walter and Eliza Hall Fellow in Economic Biology,
Queensland University.*

The subject-matter of this article is based upon a series of comprehensive experiments that space does not permit me to deal with here, but these experiments have brought to light many factors that bear upon the subject of parasitism in general and upon economic problems in particular.

The blowfly dealt with is the common blue-green *Lucilia*, which is one of the worst pests that the stock owner has to contend with. The parasites are three in number, *Mormoniella* (well known under the name *Nasonia*), *Paraspilomicrus*, and *Tachinaephagus* (the last is also called *Australencyrtus*). All three are doing valuable work in reducing diptera, notably blowflies and houseflies. These parasitic wasps are very small indeed, and as many as forty can be reared from a single puparium, but usually an average of seven emerge from a single puparium of *Lucilia*.

In my experiments I pitted *Mormoniella*, which lives forty days or more, against the puparia of this fly *Lucilia*, which persists in the pupal stage from about seven to fifteen days, according to the seasons of the year. A batch of parasites was induced on consecutive days to parasitise hosts of graduated ages. The process was repeated with several other batches of parasites with the relation to the hosts suitably altered.

From results so far obtained the conclusions drawn are—

- (1) The parasite does not deposit eggs until it is over a day old, although it repeatedly performs the action of so doing.
- (2) During the first few days the eggs of the wasp, developing in the ovaries, mature slowly and are therefore deposited at rare intervals. Under these circumstances eggs cannot be deposited at every attempted deposition.
- (3) Then follows a period lasting about a fortnight or perhaps longer when the eggs deposited range up to several hundreds. This is the period of maximum utility.
- (4) Approaching a month old, depositions become rare again and finally cease.
- (5) The puparium itself must be over a day old before it can be effectively parasitised. Parasitic eggs may be dropped therein but these do not prevent the ultimate emergence of the fly. This is the first immunity period of the host.
- (6) During the last two days of the pupal period, that is for the two days prior to the time when the fly is due to emerge, if eggs are deposited within the puparium they will not prevent the fly emerging. This is the second period of immunity.

From these conclusions it can be readily realised that failure to effect parasitism may be due to—

- (a) Failure to deposit eggs.
- (b) Eggs being deposited during two periods of immunity, one when the puparium is too young, lasting about a day, the other when the puparium is too old, lasting about two days.

As these figures are based upon a seven-day pupal period, only four days are left during which effective parasitism can take place.

So far we have dealt with *Mormoniella*, a wasp of the family *Chalcididae* and the grub of which feeds between the hard outer covering, the puparium, and the living pupa contained therein.

Paraspilomicrus is a wasp of the family *Proctotrupidae*, the adult is short lived, lasting about ten days, and the grub lives within the developing pupa of the fly, not outside it like the larva of *Mormoniella* does.

Mormoniella has a developing period lasting about fifteen days, whilst *Paraspilomicrus* takes over twice as long to reach the imago stage, consequently if

* From an address delivered to the Entomological Society, Brisbane, 31st October, 1924.

the same host is effectively parasitised by both these wasps, only the progeny of *Mormoniella* can persist. Where *Mormoniella* is not effective on puparia under a day old, *Paraspilomicrus* can parasitise a puparium a few hours after pupation has taken place.

Some of these facts, tested by experiment, explain why *Paraspilomicrus* is the rarer insect, nevertheless it appears to exist under conditions that *Mormoniella* cannot, and therefore it would play a part of special significance in the economy of nature.

The third parasite, *Tachinaephagus*, is another wasp of the family *Chalcididae*, but it has a system of attack differing from that of the other two. It deposits its eggs in the maggot of the fly, so by the time the host forms its puparium either eggs or grubs are already there.

It is necessary to explain here another of the facts discovered during my experiments on blowflies. There is a period in the life of the fly starting when the maggot has become full grown and finishing when the puparium forms. It is called the prepupal period. The wonderful part about this stage of the fly's metamorphosis is in the elasticity of its duration.

There may be breeding, a batch of maggots originally deposited by the same parent at the same time and living under the same set of conditions. These maggots will start the prepupal period together. On the third day following, the puparia of one will form and the others will do likewise in fairly quick succession, so that on the seventh day the final puparium will be formed. If, however, this same batch of maggots be placed under another set of conditions, although the first to pupate will do so on the third day, the others will extend the difference in the time taken to form the puparium, and the final one may achieve it on the sixtieth day.

This phenomenon is found to occur under natural conditions with most of the genera of blowflies and it is regarded as being due to an inherent characteristic of the individual whereby no two maggots of any one batch, deposited by the same parent, have the prepupal period of exactly the same duration.

We have seen under the account of *Mormoniella* that there are conditions rendering blowflies immune against that parasite, and the natural question arises whether there may not also be a property of immunity involved in this phenomenon of varied prepupal duration?

By experiment it has been ascertained that eggs of *Tachinaephagus* deposited in maggots between one and seven days prior to the formation of the puparium result in the emergence of parasites. Nothing is known beyond this and when projected experiments are carried out, giving the relationship with maggots that pupate three or more weeks after parasitisation takes place, it will be interesting to know whether the grub of the wasp is capable of overcoming this long wait till the puparium is formed, or if the host is immune under such conditions.

There is the possibility of yet another result; under these circumstances, the action of the grub may prevent the maggot from pupating and the failure to pupate may react upon the parasite, causing this, too, to die.

The question of properties of which this is an example—properties that bring about mutual destruction of parasite and host—has not advanced sufficiently far to warrant a full account being given. That there are such factors, however, acting under natural conditions, seems only too certain, and it is possible that mortality amongst parasites, preventing them carrying out their work of destruction more efficiently than they do, is largely owing to some such compensating factor.

These conditions appear prevalent at definite periods of the year, as certain seasons bring about the reduction of parasites that is not necessarily in conformity with the reduced breeding of the flies.

Hypothetically it may be put this way. *Mormoniella* breeds through the Brisbane winter. Certain species of blowflies pass this season in the puparium. The parasite may attack such a puparium in the arrested state of development and the grub starts feeding, but owing to the lack of development in the host, it would fail to complete its feeding and thus succumb to the hibernating condition of the host whilst doing sufficient damage to prevent the host completing its metamorphosis.

Again, though perhaps less likely, a similar result might also be caused by flies that pass their pupal stage very quickly, say four days, when the rapidity of the development may adversely affect the parasite. It is on such hypotheses, which are originally based on observations, that new experiments are to be planned.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF SEPTEMBER, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING SEPTEMBER, 1924 AND 1923, FOR COMPARISON.

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	Sept.	No. of Years' Records.	Sept., 1924.	Sept., 1923.		Sept.	No. of Years' Records.	Sept., 1924.	Sept., 1923.
<i>North Coast.</i>					<i>South Coast—continued:</i>				
Atherton	0.58	23	2.42	...	Nambour	2.50	28	1.83	1.14
Cairns	1.65	42	4.08	0.05	Nanango	1.92	42	2.18	1.30
Cardwell	1.43	52	0.57	0.23	Rockhampton ...	1.29	37	1.83	0.45
Cooktown	0.57	29	0.89	...	Woodford	2.22	37	2.12	1.87
Herberton	0.47	37	1.44	0.07					
Ingham	1.25	32	1.84	0.04					
Innisfail	3.58	43	2.61	0.78					
Mossman	1.17	15	2.19	...					
Townsville	0.78	53	1.21	0.03					
<i>Central Coast.</i>					<i>Darling Downs.</i>				
Ayr	1.52	37	0.24	1.38	Dalby	1.76	54	3.50	1.65
Bowen	0.81	53	0.44	...	Emu Vale	1.90	28	3.52	1.36
Charters Towers ...	0.77	42	0.30	0.01	Jimbour	1.59	36	3.03	1.44
Mackay	1.62	53	0.89	...	Miles	1.46	39	2.87	1.48
Proserpine	2.19	21	0.48	0.05	Stanthorpe	2.45	51	3.84	1.54
St. Lawrence	1.31	53	1.36	...	Toowoomba	2.23	52	3.49	1.10
					Warwick	1.89	59	3.09	1.20
<i>South Coast.</i>					<i>Maranoa.</i>				
Biggenden	1.67	25	2.00	1.21	Roma	1.56	50	1.62	1.81
Bundaberg	1.77	41	2.03	1.80					
Brisbane	2.07	73	1.16	1.21					
Childers	1.93	29	2.78	1.21					
Crohamhurst	2.71	30	2.12	1.45					
Esk	2.28	37	2.35	0.84					
Gayndah	1.55	53	3.20	0.50					
Gympie	2.17	54	2.39	1.61					
Glasshouse Mts. ...	2.29	16	...	1.73					
Kilkivan	1.72	45	3.17	0.52					
Maryborough	1.98	53	3.57	2.23					
					<i>State Farms, &c.</i>				
					Bungeworgorai ...	1.32	10	1.78	1.47
					Gatton College ...	1.69	25	2.65	0.69
					Gindie	1.11	25	1.24	2.74
					Hermitage	1.67	18	2.62	1.00
					Kairi	0.61	10	0.72	0.02
					Sugar Experiment Station, Mackay	1.52	27	...	...
					Warren	0.66	10	1.40	...

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for September, 1924, and for the same period of 1923, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND, State Meteorologist.

CO-OPERATIVE ASSOCIATIONS ACT—ADDITIONAL REGULATIONS.

Additional Regulations have been issued under the Primary Producers' Co-operative Associations Act providing that, upon any company previously registered under the Industrial and Provident Societies Act or the Companies Act becoming registered under the Primary Producers' Co-operative Associations Act and becoming an Association, all the assets, liabilities, &c., of such abovementioned company shall become vested in and imposed upon the said Association, and any right of action, agreement, undertaking, mortgage, &c., made, given, or entered into by the said company may be prosecuted and enforced by or against the said Association.

TWO VALUABLE FODDER TREES.

By C. T. WHITE, F.L.S., Government Botanist.

I have long been of the opinion that one of the surest ways to combat the serious droughts, that Queensland in conjunction with most other parts of Australia periodically suffers, is by the systematic planting of drought resistant fodder trees. Trees, owing to their extensive and usually deep root systems, once established have an advantage as drought resisters over grasses and herbage. Two trees commonly planted in Queensland gardens as shade trees have been brought under my notice recently as trees of considerable value as food for stock.

One of these trees is the *Phytolacca* or Bella Sombra tree (*Phytolacca dioica*) and the other the mis-called "Portugese Elm" (*Celtis sinensis*).

(a) *Phytolacca* or Bella Sombra Tree (*Phytolacca dioica*).

Description.—A large rapid-growing soft-wooded tree; leaves a rather bright glossy green, long-stalked, the stalk often purplish, lamina or blade of leaf usually oblique at the base, i.e., one side longer than the other. Flowers greenish white in long slender racemes ("spikes") of six to nine inches or even longer, the male and female flowers on distinct trees. Fruits densely clustered along the spikes, depressed globular.

Native Country.—A native of South America; widely cultivated in the sub-tropics as a shade tree.

Botanical Name.—From the Greek *phyton*, a plant, and the Italian *lacca*, lac or varnish; from the berries or fruit of some species yielding a red colour like lac.

Fodder Value.—In his "Comprehensive Catalogue of Queensland Plants" the late F. M. Bailey remarks, "Cows will devour the stem of this tree when cut down as they do our bottle tree." This, however, is a very wasteful method of utilising a very valuable fodder tree, and I was therefore glad to hear recently from my friend Professor S. B. J. Skertchly of the use of this tree as a fodder at Purga, near Ipswich. I later visited the farm of Mr. Dick, at Purga, and took the accompanying photographs of the tree in full foliage. Mr. Robert Dick kindly gave the following particulars regarding the methods of using this tree as a fodder. Mr. Dick stated: "As Queenslanders know, nine out of every ten springs come in dry, and our way of helping the calves over the spring is to prune the *Phytolacca* trees of a few branches every day. These branches are anything up to 12 feet long (one year's growth). Whether dry or not we always prune in the spring to have a strong crop of shoots next year. One cannot grasp the effect of the pruning unless seen. I may say we have known a single shoot of one year's growth to be 4 inches across at the butt, to attain 16 feet in length, and to weigh 28 lb.; of course cattle would not eat all of such a big shoot as this, but would eat all the leaves and chew the stem down to about where it was 2 inches thick. These trees make very rapid growth here. A number of young under-hanging shoots are always left to bear flowers and fruits."

As stated by Mr. Dick the tree is a rapid grower. The accompanying photograph represents a specimen two years old, about 12 feet high, and measuring 1 foot 5 inches in girth 3 feet from the ground and 2 feet 4 inches in girth at the base. The large specimen of which a photograph is given was planted in 1901, and at the present time has a girth of 8 feet 9 inches at about 3 feet from the ground. Its large spread can be seen from the photograph.

From the above it will be seen that the *Phytolacca* is a very valuable tree for planting in Queensland as a fodder.

(b) *Celtis sinensis*. Nettle Elm, mis-called "Portuguese Elm."

Description.—A deciduous leafy tree not usually very tall and with a large spreading head. Leaves glossy green above, somewhat paler beneath, the base usually but not always very oblique (i.e., lopsided), mostly 1½-2 inches long and 1 to 1½ inches broad, borne on a stalk of about one-third of an inch. The edge



PLATE 109.—PHYTOLACCA OR BELLA SOMBRA TREE.

1.—Tree showing fine growth, the result of regular pruning.

2.—Young Tree, two years old.

3.—Shoot of one season's growth ; height, 15 feet.



PLATE 110.—FLOWERING TWIG (MALE) OF THE PHYTOLACCA OR BELLA SOMBRA TREE.



PLATE III.—*CELTIS SINENSIS*; SO-CALLED "PORTUGUESE ELM."
A Valuable Fodder Tree.

bluntly toothed in the upper part of the leaf. Flowers insignificant. The fruits are small rounded drupes (berries) borne on slender stalks of about one-quarter of an inch long in the axils of the leaves, yellow when ripe and about one-quarter of an inch in diameter.

Native Country.—China; a widely spread tree in the Orient.

Fodder Value.—Our attention was first drawn to this tree as a fodder by Mr. E. Everett, Inspector of the State Advances Corporation at Gayndah, who, in a letter dated 31st December, 1923, wrote:—

“I would like to draw attention to a splendid fodder tree which grows along the banks of the river at Gayndah and in some instances is used as an ornamental tree. I have been told that the name of the tree is ‘Portuguese Elm.’ It sheds its leaves annually but has a most luxuriant growth of leaves from about October to June, and if these trees were planted along the river and creek banks there would never be any occasion to lose a beast from starvation during those months in the most severe drought. The trees are hardy, but of course require protection until they grow out of reach of horses and cattle. Small trees can be got by thousands under the trees, but cattle and horses never let them grow high when within their reach. I have had experience with Currajong, Oak, and Bottle tree, which will keep cattle alive for a little while, but they will thrive and improve on Portuguese Elm. If any officer of the Agricultural Department passes through Gayndah at any time I should much like to show him these trees and give him any information I possess on the matter.”

The point brought forward by Mr. Everett is a very important one, and I fully endorse his opinion that the planting of fodder trees would in the end go a long way to mitigating the losses of stock that occur during every drought period.

Celtis australis is another species that is grown in Queensland gardens but to a less extent than *C. sinensis*. Of *C. australis* Sir George Watt, in his “Dictionary of Economic Products of India,” says, “The tree is largely planted for fodder, cows fed on the leaves are supposed to give better milk.” This species would no doubt stand greater degrees of cold than *C. sinensis* and would be a valuable tree for the Darling Downs, where some fine trees are already to be found.

Botanical Name.—*Celtis*, one of the names anciently given to the Lotus. Tournefort first applied the name to the modern genus which may be said to resemble both in the fruit and foliage the shrubby Lotus of the ancients (Loudon, Dictionary of plants); *sinensis*, a native of China, from the Latin *Sinæ*, an Oriental people.

Common Name.—Though the tree is a native of China, in Queensland the tree is known almost everywhere under the name of “Portuguese Elm.” This arose, no doubt, from its confusion with another species of *Celtis* (*C. australis*) cultivated in the cooler parts of the State, and a native of Southern Europe.

Identification of the Tree.—The present tree is common in Queensland gardens and has variously passed as *Celtis australis*, *C. Krausiana*, and *C. occidentalis*, but as I could not fit it in with any of these species, I sent specimens to the Director, Arnold Arboretum, Boston, U.S.A., and obtained the reply that the tree was *C. sinensis*, a native of China, and widely spread in the Orient.

QUEENSLAND TREES.

By C. T. WHITE, F.L.S., Government Botanist, and W. D. FRANCIS, Assistant Botanist.

The broad-leaved Leopard tree (*Flindersia collina*) is a conspicuous species in the “scrubs” where it is found, as the bark is greenish grey in colour and is shed in rounded or irregularly oval pieces which leave very prominent depressions. The bark is very thin, measuring $\frac{3}{8}$ inch on a tree with a stem diameter of 2 feet 3 inches. The trees attain a height of about 100 feet. The wood is yellow and hard. The species is mostly found in the drier “scrubs,” such as those of Rosewood, Nanango, &c. It has been found as far north as Childers and as far west as Taroom. In New South Wales it has been found in the Tweed River district.



Photo. by Authors.]

PLATE 112.—BROAD-LEAVED LEOPARD TREE (*Flindersia collina*).
A Tree in the Nanango District.



Photo.: Dept. Agric. and Stock.]

PLATE 113.—THE BROAD-LEAVED LEOPARD TREE.

- A.—Seedling or coppice leaf. B.—Capsule valve, showing back or exterior.
.. C.—Capsule valve, showing interior.

EGG-LAYING COMPETITIONS.

N.U.P.B.A., ZILLMERE.

Three thousand six hundred and eighty-seven eggs were laid during September, the average per bird being 21·7—with 21·8 in the White Leghorn, 21·6 in the Black Orpington, and 22·4 in the Other Varieties sections.

The health of the birds has been good, but broodiness has interfered with the laying of some of the pullets. Nos. 109, 112, 116, 122, 129, 134, 135, 136, 145, 158, 164, 167, and 169 being affected.

WHITE LEGHORNS.

Pen No.	Owner.	Sept.	Total.	Pen No.	Owner.	Sept.	Total.
104	Oakleigh P. F.	28	153	47	Turner, R. C. J.	25	82
21	Hodge, A.	27	134	107	Howard, W. L.	20	82
105	Oakleigh P. F.	25	134	59	Staib, A. (Replace,		
97	Sommerlad, K. A.	23	133		13-6-24)	22	75
20	Hodge, A.	24	131	62	Carinya P. F.	21	75
82	Wakefield, W.	24	129	69	Kidd Bros.	23	75
84	Wakefield, W.	24	129	63	Carinya P. F.	25	74
19	Hodge, A.	23	125	26	Britten, H. T.	19	72
78	Newberry, M. F.	23	125	5	Pember, H. T.	25	71
95	Williams, G.	25	122	83	Wakefield, W.	16	69
6	Pember, H. T.	23	121	172	Grenier, S. L.	23	66
12	Berry, W. J.	25	120	34	Chapman, J. L.	22	65
76	Newberry, M. F.	22	120	91	Hodgson, C. A.	22	64
89	Duff, R.	23	120	17	Webster, J. T.	1	21
88	Duff, R.	24	119	94	Williams, G.	3	7
90	Duff, R.	25	119	30	Campbell, M. H.	25	B123
103	Oakleigh P.F.	11	116	67	Kidd Bros.	22	B122
79	Purnell, J. E. G.	24	115	71	Wilson, J. R.	26	B119
16	Webster, J. T.	25	113	35	Chapman, J. L.	23	B116
48	Turner, R. C. J.	24	111	75	Raymond, E. C.	23	B113
41	Cole, R. C.	24	109	52	Rogers, G. E.	22	B112
68	Kidd Bros.	24	109	28	Campbell, M. H.	22	B110
25	Britten, H. T.	23	108	29	Campbell, M. H.	22	B109
64	Tracey, E.	22	108	42	Cole, R. C.	22	B107
101	Walters, A. S.	25	107	49	Earl, J.	20	B105
73	Raymond, E. C.	23	107	14	Marks, G.	26	B103
92	Hodgson, C. A.	21	107	77	Newberry, M. F.	23	B80
100	Walters, A. S.	25	107	72	Wilson, J. R.	22	B78
46	Turner, R. C. J.	22	106	33	Hindes, W. and G. W.	21	B75
11	Berry, W. J.	25	105	24	Neil, A.	18	B67
60	Staib, A.	14	105	173	Grenier, S. L.	14	B48
61	Carinya P.F.	26	104	7	Sturman, H.	10	B38
174	Grenier, S. L.	25	103	85	Enroh Pens	22	BE137
1	Williams, F. J.	22	101	70	Wilson, J. R.	28	BE129
39	Fraser, H.	23	101	55	Hutton, J.	27	BE128
58	Staib, A.	24	101	66	Tracey, E.	24	BE123
93	Hodgson, C. A.	15	100	81	Purnell, J. E. G.	25	E120
13	Marks, G.	24	99	31	Hindes, W. and G. W.	27	BE118
38	Fraser, H.	17	99	102	Walters, A. S.	23	E116
15	Marks, G.	26	98	54	Rogers, G. E.	11	E114
40	Cole, R. C.	22	98	27	Britten, H. T.	20	E112
56	Hutton, J.	24	98	32	Hindes, W. and G. W.	22	BE110
65	Tracey, E.	25	98	18	Webster, J. T.	23	BE109
80	Purnell, J. E. G.	22	98	53	Rogers, G. E.	25	E106
51	Earl, J.	24	96	36	Chapman, J. L.	17	E100
99	Sommerlad, K. A.	23	96	57	Hutton, J.	21	BE100
74	Raymond, E. C.	22	95	37	Fraser, H.	26	BE95
106	Howard, W. L.	25	97	22	Neil, A.	16	BE94
87	Enroh Pens	21	90	9	Sturman, H.	25	BE93
108	Howard, W. L.	23	90	8	Sturman, H.	22	E92
45	Adams, P. F.	22	89	23	Neil, A.	19	BE90
98	Sommerlad, K. A.	22	88	2	Williams, F. J.	22	E89
10	Berry, W. J.	24	85	3	Williams, F. J.	22	E86
86	Enroh Pens	19	85	96	Williams, G.	23	BE86
44	Adams, P. F.	21	82	4	Pember, H. T.	24	E79

B signifies bird under standard weight.

E signifies egg under standard weight.

BLACK ORPINGTONS.

Pen No.	Owner.	Sept.	Total.	Pen No.	Owner.	Sept.	Total.
126	Brotherton, T.	.. 25	155	148	Raymond, E. C.	.. 20	97
127	Walters, E.	.. 28	152	112	Wilson, W. R.	.. 22	96
156	Hutton, J.	.. 27	145	134	Dennis, C.	.. 16	94
130	Rogers, G. E.	.. 24	144	152	Enroh Pens	.. 22	84
110	Fanning, T.	.. 18	138	118	Chaille, H. M.	.. 10	65
129	Walters, E.	.. 22	136	121	Potter, J.	.. 11	56
116	Campbell, G. L.	.. 16	134	141	Pryde, J. (Replace, 7-7-24)	.. 20	53
144	Cummings, F. P.	.. 22	133	124	Brotherton, T. H. (Replace, 30-8-24)	25	27
111	Fanning, T.	.. 25	130	119	Chaille, H. M.	.. 21	B102
113	Wilson, W. R.	.. 22	129	114	Wilson, W. R.	.. 27	E153
143	Cummings, F. P.	.. 23	129	142	Cummings, F. P.	.. 28	E140
131	Rogers, G. E.	.. 24	127	115	Campbell, G. L.	.. 20	E138
139	Pryde, J.	.. 24	125	147	Everlay P. Y.	.. 27	E138
155	Hutton, J.	.. 19	125	138	Adams, W. S.	.. 24	BE136
133	Dennis, C. C.	.. 21	123	154	Hutton, J.	.. 27	E135
150	Raymond, E. C.	.. 28	121	117	Campbell, G. L.	.. 17	BE131
145	Everlay P. Y.	.. 6	113	109	Fanning, T.	.. 22	E127
120	Chaille, H. M.	.. 21	111	123	Potter, J.	.. 25	E121
125	Brotherton, T. H.	.. 19	109	136	Adams, W. S.	.. 21	E110
153	Enroh Pens	.. 24	109	140	Pryde, J.	.. 27	E105
128	Walters, E.	.. 18	105	122	Potter, J.	.. 17	E95
132	Rogers, G. E.	.. 20	100	151	Enroh Pens	.. 23	E85
149	Raymond, E. C.	.. 23	100	135	Dennis, C. C.	.. 16	E73
137	Adams, W. S.	.. 28	97				
146	Everlay P. Y.	.. 21	97				

OTHER VARIETIES.

169	Pryde, J. (Lang.)	.. 25	116	164	Walters, A. S. (B.R.)	10	69
159	Messines P. F. (R.I.R.)	23	111	176	Everlay P. Y. (B.L.)	22	58
160	Ollier, T. C. (B.R.)	.. 21	98	163	Walters, A. S. (B.R.) (Replace, 3-7-24)	22	50
162	Forsyth, W. H. (S.W.)	22	98	170	Pryde, J. (Lang.) (Replace, 23-6-24)	21	B69
161	Ollier, T. C. (B.R.)	.. 25	97	175	Everlay P. Y. (B.L.)	25	E106
167	Forsyth, W. H. (S.W.)	9	97	162	Ollier, T. C. (B.R.)	.. 28	E92
180	Ferguson, J. and Son (B.L.)	.. 26	95	171	Pryde, J. (Lang.) (Replace, 21-6-24)	25	E72
158	Messines P. F. (R.I.R.)	17	94	177	Everlay P. Y. (B.L.)	20	E61
165	Walters, A. S. (B.R.)	20	89	179	Ferguson, J., and Sons (B.L.)	.. 24	54
166	Forsyth, W. H. (S.W.)	17	84				
157	Messines P. F. (R.I.R.)	24	83				
178	Ferguson, J., and Sons (B.L.)	.. 23	71				

B signifies bird under standard weight.

E signifies egg under standard weight.

C. KIDD, Hon. Secretary.

N.U.P.B.A. TOOWOOMBA SUB-BRANCH.

Single Test Egg-laying Competition—Scores to 30th September, 1924.

BLACK ORPINGTONS.

Pen No.	Owner.	Sept.	Total.	Pen No.	Owner.	Sept.	Total.
2	Hutton, J.	.. 20	142	23	Carr, T. J.	.. 25	131
9	Everlay P. Farm	.. 24	140	41	Wilson, W. R.	.. 25	131
51	*Holmes, R.	.. 27	138	28	Williams, W. D.	.. 19	130
52	Holmes, R.	.. 20	137	33	Potter, Jas.	.. 21	130
45	Stephens, H. B.	.. 26	136	20	Maund, Mrs. L.	.. 23	129
42	Wilson, W. R.	.. 25	133	5	Walters, E.	.. 24	125
24	*Carr, T. J.	.. 22	132	7	*Adams, P. F.	.. 16	122
29	*Adams, W. S.	.. 19	132	11	Webb, A. W.	.. 5	122

*Signifies bird laying under-weight eggs.

BLACK ORPINGTONS—continued.

Pen No.	Owner.	Sept.	Total.	Pen No.	Owner.	Sept.	Total.
15	Macfarlane, K.	.. 22	122	21	Walsh, H.	.. 20	99
40	Rogers, G. E.	.. 21	121	44	Smith, E. R.	.. 12	95
10	Everlay P. Farm	.. 25	120	48	Head, J.	.. 25	95
22	*Walsh, H.	.. 10	120	31	*Radford, G.	.. 2	92
49	*Ollier, T. C.	.. 19	120	37	Short, J. W.	.. 15	92
32	Radford, G.	.. 22	118	16	*Macfarlane, K.	.. 25	90
3	McLay, J. A.	.. 21	116	14	Burns, R.	.. 22	84
39	Rogers, G. E.	.. 23	116	34	*Potter, J.	.. 23	82
43	Smith, E. R.	.. 21	116	46	Stephens, H. B.	.. 21	82
50	Ollier, T. C.	.. 25	116	47	*Head, J.	.. 19	80
19	Maund, Mrs. L.	.. 23	111	4	McLay, J. A.	.. 23	74
25	Stephens, Moss	.. 23	109	8	Adams, P. F.	.. 23	73
6	Walters, E.	.. 21	107	38	Short, J. W.	.. 24	73
30	Adams, W. S.	.. 26	107	26	Stephens, Moss	.. 23	70
13	Burns, R.	.. 15	105	35	Rivett, R. R.	.. 7	60
1	Hutton, J.	.. 21	104	18	*Champion, S. H. K.	.. 20	59
36	Rivett, R. R.	.. 23	103	17	*Champion, S. H. K.	.. 1	40
27	Williams, W. D.	.. 20	102	12	Webb, A. W.	.. 0	16

OTHER VARIETIES.

60	Le Pla, A. W. (R.I.R.)	26	144	71	Brand, V. (R.I.R.)	17	90
70	*Dibbs, H. (Lang.)	.. 29	142	54	Warrian, C. G. (Rock.)	19	89
53	Warrian, C. G. (Rock.)	26	134	69	Dibbs, H. (Lang.)	.. 9	89
66	*Becker, W. (Lang.)	23	130	55	Carr, T. J. (S. W'dotte)	.. 17	61
59	Le Pla, A. W. (R.I.R.)	20	129	63	Rafter, J. J. (B.L.)	.. 18	60
57	*Maund, Mrs. L. (Col. W'dotte.)	.. 26	123	72	Brand, V. (R.I.R.)	.. 19	60
65	*Becker, W. (Lang.)	25	115	58	Maund, Mrs. L. (Col. W'dotte)	.. 9	57
61	Harrington, J. (B.L.)	20	108	67	Everlay P. Farm (B.L.)	17	44
56	*Carr, T. J. (S. W'dotte)	24	107	62	*Harrington, J. (B.L.)	1	42
68	*Everlay P. Farm (B.L.)	..	104				
64	Rafter, J. J. (B.L.)	20	91				

WHITE LEGHORNS.

132	*Short, J. W.	.. 26	155	125	*Maurer, G.	.. 24	111
114	Cole, R. C.	.. 28	144	109	*Enroh Pens	.. 22	110
112	*Chapman, S.	.. 26	143	75	Wilson, W.	.. 20	109
131	*Short, J. W.	.. 24	140	85	Rivett, R. R.	.. 27	109
105	Hutton, J.	.. 24	139	97	Hunt, G.	.. 24	108
124	King, J. E.	.. 24	132	117	Goggins, J.	.. 24	107
73	Dippell, D.	.. 26	131	77	Howard, R. B.	.. 20	106
110	*Enroh Pens	.. 21	129	95	Adams, W. S.	.. 23	106
74	Dippell, D.	.. 21	129	87	Warrian, C. G.	.. 22	105
121	Grant, W.	.. 24	128	99	*Newton, J. W.	.. 22	105
91	Stilton, G.	.. 25	127	108	Adams, P. F.	.. 18	105
106	*Hutton, J.	.. 23	126	86	Rivett, R. R.	.. 24	104
111	Chapman, S.	.. 23	126	96	Adams, W. S.	.. 24	104
78	Howard, R. B.	.. 12	125	116	Taylor, J.	.. 24	103
122	Grant, W.	.. 23	125	128	Stilton, E. J.	.. 19	101
123	King, J. E.	.. 23	121	76	Wilson, W.	.. 21	99
129	Manning, H. G.	.. 22	121	81	Smith, E. R.	.. 24	96
118	Goggins, J.	.. 28	120	104	*Fallon, P. J.	.. 14	95
93	Williams, D. W.	.. 22	119	107	Adams, P. F.	.. 23	94
113	Cole, R. C.	.. 27	117	130	*Manning, H. G.	.. 27	94
88	*Warrian, C. G.	.. 26	115	80	McBean, S.	.. 22	93
100	*Newton, J. W.	.. 23	115	120	Rogers, G. E.	.. 24	93
115	Taylor, J.	.. 23	114	79	*McBean, S.	.. 26	90
101	Turner, R. C. J.	.. 25	112	83	Carinya P. Farm	.. 24	90
103	*Fallon, P. J.	.. 18	111	90	Ellis, L. E.	.. 24	90

* Signifies bird laying under-weight eggs.

WHITE LEGHORNS—continued.

Pen. No.	Owner.	Sept.	Total.	Pen. No.	Owner.	Sept.	Total.
126	Maurer, G. . .	23	90	119	Rogers, G. E. . .	21	81
127	Stilton, E. J. . .	18	90	94	Williams, D. W. . .	20	79
102	Turner, R. C. J. . .	21	89	89	Ellis, L. E. . .	21	78
92	Stilton, G. . .	22	88	98	Hunt, G. . .	18	64
84	Carinya P. Farm . .	23	86	82	Smith, E. R. . .	23	57

* Signifies bird laying under-weight eggs.

GRAND TOTALS FOR SEPTEMBER.

Black Orpingtons	..	..	..	..	1,027
Other varieties	..	..	..	..	387
White Leghorns	..	..	..	..	1,363
					<hr/> 2,777

Average: 21.04 eggs per bird.

GRAND TOTALS TO DATE.

Black Orpingtons	..	..	..	..	5,499
Other varieties	..	..	..	..	1,966
White Leghorns	..	..	..	..	6,493
					<hr/> 13,958

Average: 17.62 eggs per bird per month for six months.

JOSEPH GARNER, Government Supervisor.

BRONZY ORANGE SUCKING BUG.

It has been brought to the notice of the Department of Agriculture that the Bronzy Orange Sucking Bug is presenting itself in large numbers generally throughout the North Coast fruit district as it did this time last year. As this insect has been proclaimed a pest under the Diseases in Plants Act, every citrus grower in whose orchard this pest is present must take one of the following precautions immediately:—

(1) Cyanide the trees; or (2) drive every immature insect from the trees on to the ground by means of tapping the branches of the trees with a padded stick, so as to dislodge the insects harbouring thereon and cause them to fall to the ground, from which they will be unable to return to the trees provided a bandage is first placed round the trunk of the tree and is then smeared with tanglefoot; or (3) spray thoroughly with a contact spray such as an oil emulsion, resin and soda wash, nicotine sulphate, or Boulli labordi.

These sprays will kill quite a number of insects and will cause others to fall to the ground from where they are unable to return to the trees, provided a bandage smeared with tanglefoot, as recommended, is placed round the trunk of the tree. If these simple precautions are taken by every grower without delay the damage done by these insects will be reduced to a minimum, but if, on the other hand, the bugs are allowed to mature, the mature insects will produce countless thousands of eggs with which to carry over the pest from season to season. Mature (viz., winged) insects must be gathered and destroyed by hand. The best time to do this is in the early morning as they are then sluggish and do not take wing readily. The Agricultural Chemist has supplied the following formulæ for Boulli labordi and tanglefoot:—

Dissolve 8 oz. of resin, 3 oz. caustic soda, 6 oz. methylated spirits, and 5 oz. liquid ammonia in a quart of water. Heat if necessary to dissolve the resin, and add water to make up four gallons.

To make tanglefoot:—(1) Melt together 8 parts resin, 4 parts turpentine, 4 parts rapeseed oil, and half a pint of honey; or

(2) Boil to a thick paste 1 lb. of resin, 3½ oz. linseed oil, and 3½ oz. molasses; or

(3) Carefully boil linseed oil until it becomes syrupy and tack on cooling.



PLATE 114.—A SECTION IN THE AUSTRALIAN PAVILION, EMPIRE EXHIBITION, WIMBLEY PARK, ENGLAND.



PLATE 115.—HOW A REPRESENTATION OF QUEENSLAND'S NEW INDUSTRY WAS STAGED AT WEMBLEY.

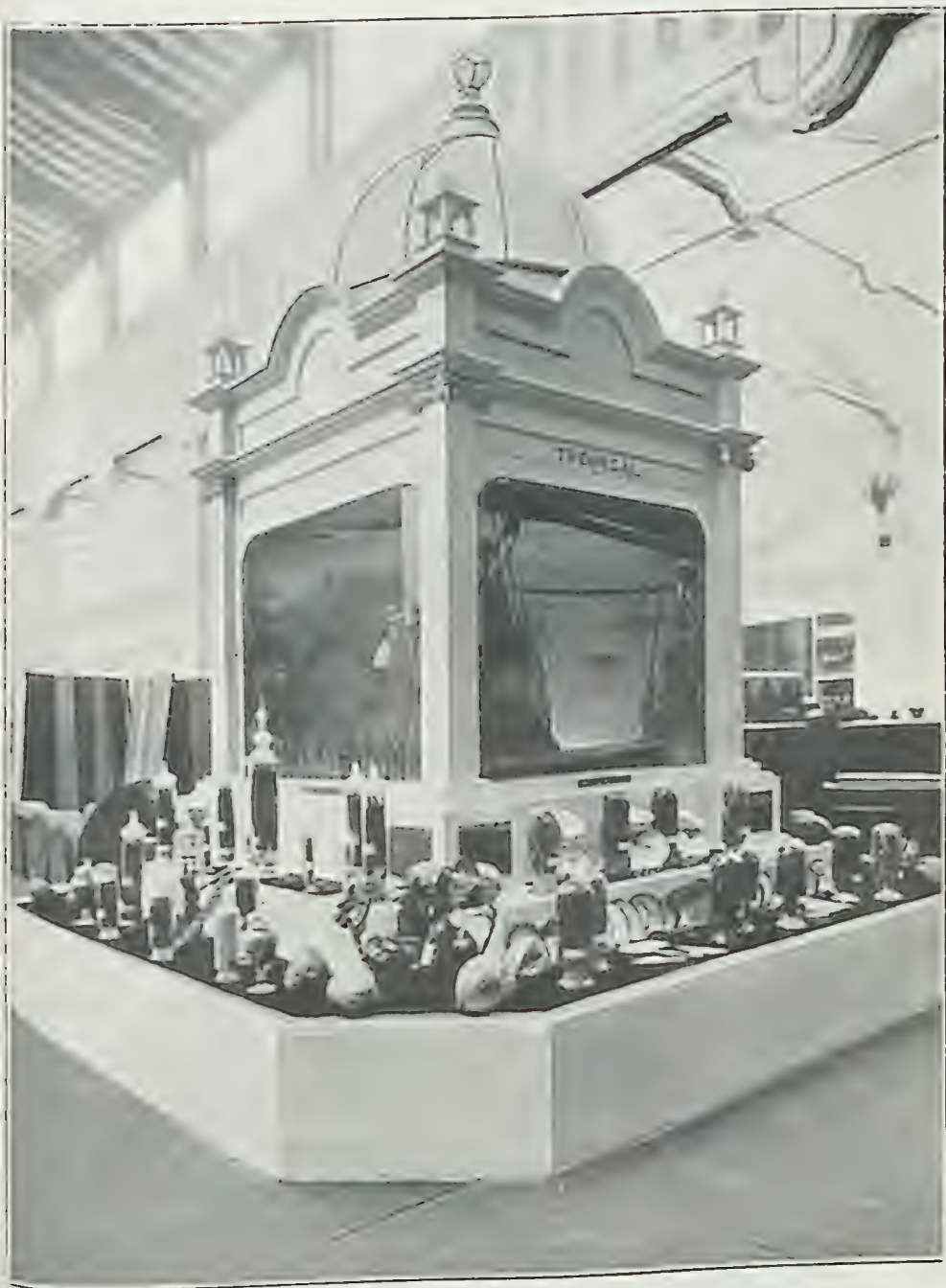


PLATE 116.--QUEENSLAND TROPICAL PRODUCE AT WEMBLEY.

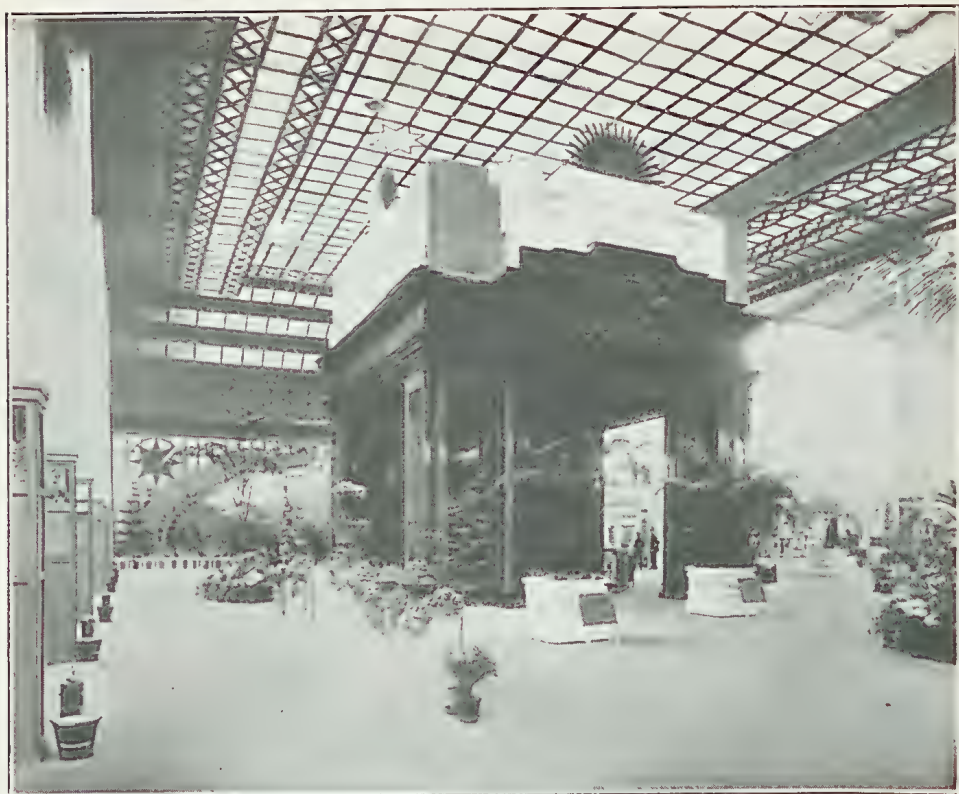


PLATE 117.—OUR WEALTH IN WOOD ILLUSTRATED IN THE AUSTRALIAN PAVILION, WEMBLEY.

The Central Trophy is made entirely of polished Australian timbers. The world is interested in Australia's unique forest resources.

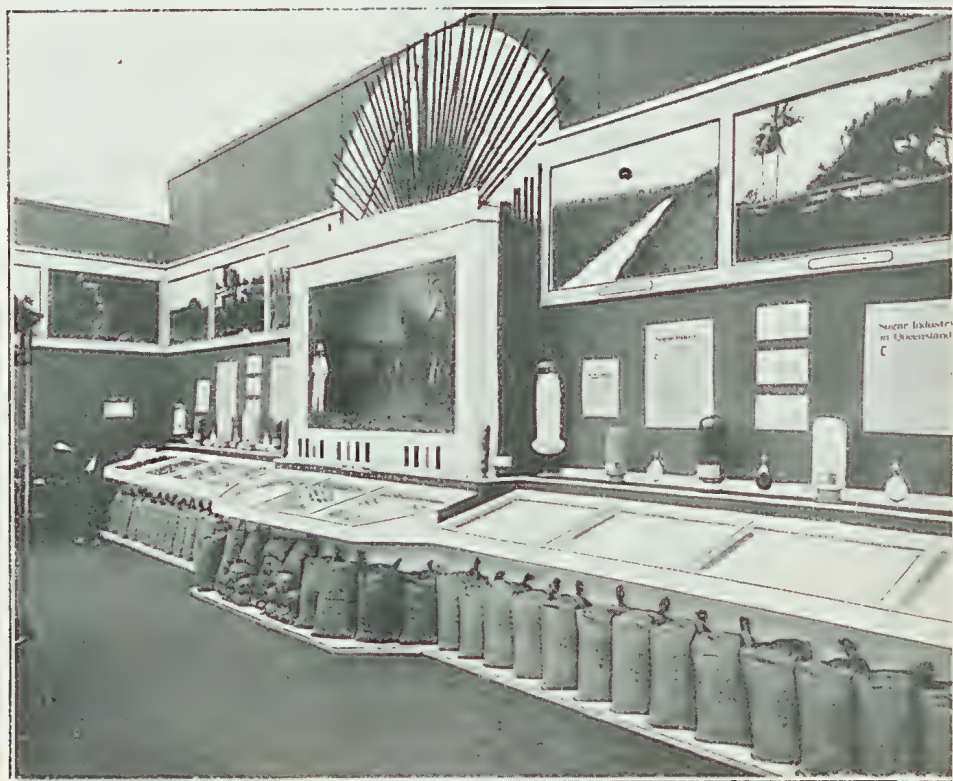


PLATE 118.—THE QUEENSLAND SUGAR INDUSTRY ILLUSTRATED AT WEMBLEY.



PLATE 119.—AUSTRALIAN WOOL AT WEMBLEY.

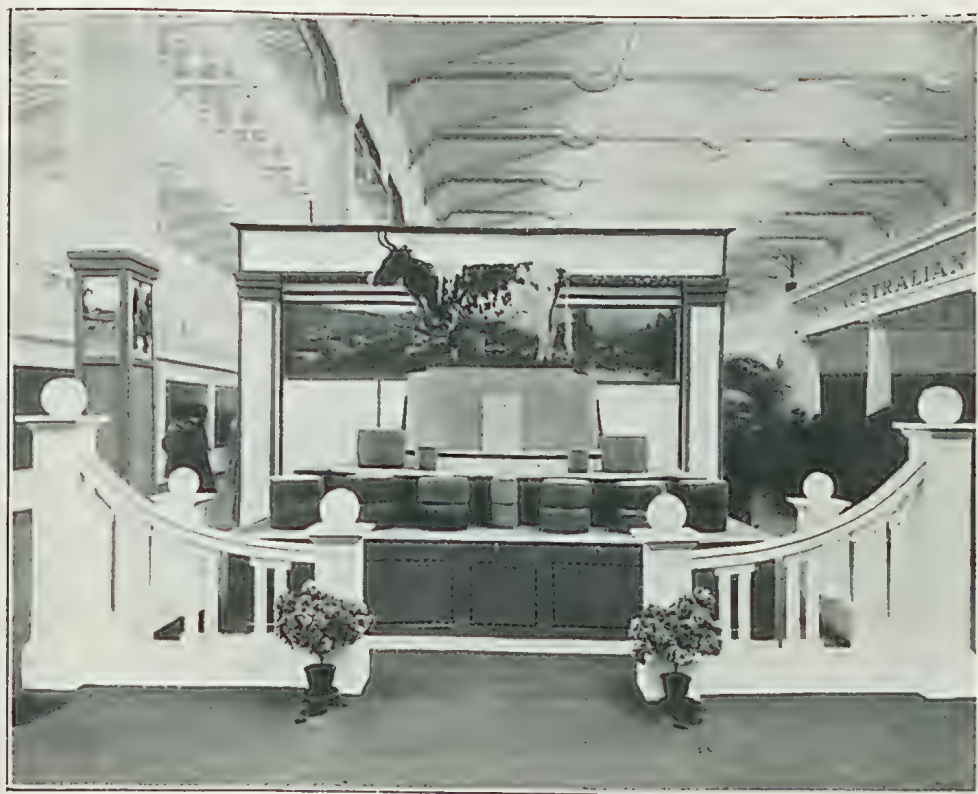


PLATE 120.—PITTSWORTH (QUEENSLAND) CHEESE AT WEMBLEY.

THE GLOUCESTER OLD SPOT PIG.

A BREED NEW TO QUEENSLAND.

E. J. SHELTON, H.D.A., Instructor in Pig Raising.

That the interest being created in the breeding of a better type of pig is being well sustained is evidenced by the fact that quite recently several new or comparative new (to Queensland) breeds of pigs have been introduced into Australia from countries overseas—the British Large Black, whose introduction was referred to in the October issue of the Journal and whose home is in the counties of Devon and Cornwall (England), and the Duroc-Jersey coming from Canada and the United States of America. This American red pig came to Queensland as a result of a careful investigation into the merits of the breed whilst Mr. Fred. G. Brown, of Mooroombin Farms, Toogoolawah, was visiting Canada three years ago. Now we have a further introduction in the Gloucester Old Spot, a breed whose original home is in the lowlands of old Gloucestershire and Somerset of England. This latter breed is one of the old English types, interest in which had, it would seem to appear, almost been allowed to lapse until about ten or twelve years ago, when fanciers of the type got together and formed what has since been called the Gloucester Old Spot Pig Society. At this time also a scale of points and their relative values was adopted.

The first consignment of Gloucester Old Spot pigs to land in Australia arrived in Melbourne per s.s. "Boorara" some time ago. The shipment consisted of thirty-two sows and eight boars selected from the best studs in England. They have been sent out by the society controlling the interests of this breed in charge of Mr. A. E. Ball, a Somerset farmer, who with his wife and family of seven sons had decided on settling in Victoria.

In a recent communication received from Mr. Ball and dealing with the merits of this breed he has the following to say:—

"First of all I would say the Gloucester Old Spot pig was, until recent years, kept entirely in the West of England, over a large area on which practically no other breeds were kept as far back as we have any knowledge or records of pig breeding. So pure have they been kept that I have never heard of a pure black or a pure white pig being born. Some have less spots, some have more, but they always have been and are now a spotted black and white breed. (See Plate.) It was not until 1913 that three west country farmers met at the London Dairy Show and first talked over the question of founding a breed society for the preservation and protection of this old spotted breed of pigs. The outcome of this convention was that a society was initiated to control the destinies of the breed. Shortly after came the Great War, which severely handicapped the young committee thus formed. Nevertheless, so well and favourably known had the breed become, that where £8 to £10 was a good price for a spotted pig before the year 1913, as much as 600 guineas had been paid for a boar at the Royal Agricultural Show of London in 1919, and 1,050 guineas was paid for half of a litter bred by the late Mr. H. Bridgman, and a sale average had been obtained of £103 for forty-eight head.

"The secretary of the society, writing the first year, stated that after the founders had paid for the incorporation and other fees and purchase of books exactly two pence was left to purchase a receipt-book. Seven years after the assets of the society reached the value of £4,000, while during the month of December, 1919, between £1,300 and £1,400 was received for entry and membership fees—an incredible income for a whole year for any pig breed society a year or two before; whilst the herd book of 1920 was the largest published by any pig breed society of Europe. The herd book numbers of 1921 carried the boar numbers from 2,507 to 3,914 and the sows from 7,030 to 12,412. To-day the Gloucester Old Spot pig is a popular pig in every county in England and bred more or less in nearly every country of the world. At the time of writing (September, 1924) they have been in Australia one year, and I receive letters every week from all over the country from satisfied breeders who prophesy an especially successful future for the breed here.

"Before attempting to give any description of the pig, I should like to say that the shipment of unrelated boars and sows, which it was my privilege to bring out from England, were specially picked by the Gloucester Old Spot Society to introduce the breed here. All of them are from noted prize-winning strains. This is a novel and, all will agree, a splendid and economical way of procuring imported stock. The Gloucester Old Spot is noted for its great length of side, with big hams and loins, a thick belly and yet not a heavy fat back. They are very popular with the butcher, as they provide a young tender carcass, full of lean meat, with the bulk of its weight in the hindquarter, from which the highest priced meat is obtained. They also weigh exceptionally well. I have frequently heard critics complain that they never get fat. It is true that a pig that grows very fast does not put on the fat on the back like an older matured pig will, and as these



PLATE 121.

Note the colour, shape, and general type of this new breed.



PLATE 122.—GLOUCESTER SPOT TYPES.

These two pigs were recently purchased from Victoria by Mr. C. W. Roseblade, of Yungaburra, North Queensland.

pigs are 120 lb. to 140 lb. when half grown, they do not carry a lot of wasteful fat. But the feeder is quite satisfied to obtain the same price for his six-month-old pig as many others do at nine and ten months, besides getting a ready sale where the matured fat pig is often hard to dispose of.

"At the Smithfield carcass competitions the Gloucester Old Spots have won the last three years for providing the greatest weight for age against all breeds. The pigs of 1922 weighed 360 lb. each at eight months, dressed weight. These pigs also lost less weight in killing than any other breed. With good feeding, porkers are ready at fourteen weeks and baconers at five to six months old.

"The sows are splendid breeders and one of the finest mothers in the world. One of the points much valued by breeders of this type here is that the pigs are quiet and docile in their habits, children can with perfect safety handle the ears of any of my boars or go into the pen with a sow that has just farrowed and handle the young pigs. These pigs are also noted for their fine grazing habits, and should be very useful in this respect with lucerne-growers."

In so far as colour is concerned the breed is perfectly distinct from other breeds and should have clear markings of equal black or white, but on the light side for preference. Wrinkles in the skin or a pronounced line of mane bristles or a decidedly sandy colour are disqualifications and should not be tolerated.

Purchases of Gloucester Old Spot pigs have recently been made for Queensland by Mr. C. W. Roseblade, of Yungaburra, *via* Cairns, on the Atherton Tableland, North Queensland (see Plate), and by the Brisbane Three-ply Timber Company, whose purchases were made through Mr. W. J. Warburton, of Northgate, whilst this breeder was in attendance at the Melbourne Show. These latter pigs, it is understood, are to form the foundation of a stud at the Kingston Butter Factory piggery.

The scale of points adopted by the Gloucester Old Spot Pig Society is as under:—

Gloucestershire Old Spot Pig Society, England.

Scale of points and their relative values in Gloucestershire Old Spot pigs as adopted by the Council.

Head—Wide between ears, medium length	4
Nose—Medium length, wide, slightly dished	4
Ears—Broad at base, drooping forward over nose, not to the sides, not thick nor coarse. Same length as nose	4
Neck—Medium length and muscular. Jowl must not be pronounced	4
Chest—Wide and deep	4
Shoulders—In line with ribs and not projecting, must not show coarseness	4
Back—Long and level, must not drop behind shoulders.	10
Ribs—Deep, well sprung	6
Loin—Very broad	6
Sides—Very deep, presenting straight bottom line. Belly and flank full and thick. Well filled line from ribs to hams	8
Quarters—Long, wide, and not drooping. Tail set high and strong	8
Hams—Large, well filled to hocks	10
Legs—Short and straight	4
Skin—Should be black under black hairs and white under white hairs. Must not show coarseness or wrinkles	8
Coat—Fairly thick, long, and silky, not curly. Must not show coarse mane bristles. Black spots on white coat. Black should not predominate	6
Type and general appearance	10
Total	100

Objections.

Head—Narrow face and nose.

Ears—Short, thick, and elevated.

Coat—A rose on the back disqualifies. A pronounced line of mane bristles very objectionable. Decidedly sandy colour may disqualify.

Skin—Serious wrinkles may disqualify.

Legs—Crooked, especially in young pigs.

Neck—Heavy jowl objectionable.

Teats—Bad teats or less than ten.

Note.—This scale of points has now also been adopted by the Australian Stud Pig Breeders' Society (incorporating the Berkshire and Yorkshire Society of Australia).

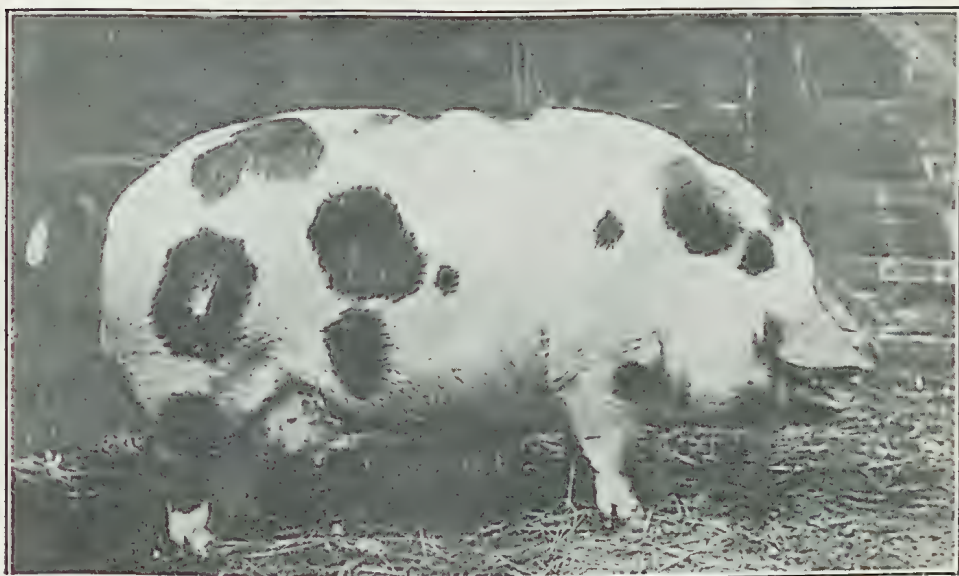


Photo. by C. Hosegood.]

PLATE 123.—G.O.S. Sow, "NASHES DUCHESS 3RD."

1st Buntingford Show, 1922 ; 1st Hertfordshire Show, 1922 ; 2nd Tring Show, 1922



PLATE 124.—"WINTERBOURNE GIFT" AND LITTER.

Winterbourne Gift's two sisters were sold for 200 guineas each, whilst six of her half-sisters realised 1,055 guineas. The property of A. E. Ball, Blagdon, Somerset.



PLATE 125.—A CHAMPION PRIZE-WINNING POLAND-CHINA SOW "DANESBORO JUDY,"

Note the great quality and evenness of type of this animal,

EARLY HISTORY OF THE PIG.

E. J. SHELTON, H.D.A., Instructor in Pig Raising.

Historical records in which many references are made to cattle, sheep, swine, and other stock, informs us that from the very earliest times the pig has been subject to domestication and his flesh used as food.

Amongst certain of the ancient nations the flesh of the pig was held in the highest estimation, whilst by others it was abhorred. There are many references to swine (as pigs are frequently called) in Holy Writ, and in the writings of the early historians, Pliny, Columella, and the Roman historians. Many wrote before the Christian era of pigs abnormally fat: one mentions the case of a sow being so fat that a field mouse made its nest in the fat along the back and produced young therein. The Egyptians not only abstained from eating the flesh of the pig but regarded the mere touch of the animal as pollution, whilst those using the flesh as food were considered degraded outcasts. Similar feeling was entertained by the Hindoos, who even to this day abhor the sight or smell of the pig.

In the marvellous commonwealth of which Moses was the head, a like abhorrence was noted and the Children of Israel were advised both by precept and example to abhor the pig's flesh. The Levitical code on this subject is precise and in the precepts, warnings and threatenings of the Prophets, the use of pig's flesh is denounced as a breach of the law and an abomination in the sight of God. Mahommed, one of the great leaders of men in the East, would not allow the pig to be mentioned or used in any way.

At the present day in the New Hebrides and in many of the South Sea Islands the pig is regarded both as a sacred animal and a sign of wealth. The native who can give a feast and kill more pigs than any of his fellows becomes a "chief." The natives generally find tremendous satisfaction in killing a large number of pigs as they firmly believe they will find in another world all the pigs they owned in this.

The pig's tusks are held as sacred; they are worn as charms and are carefully preserved under little huts in their "Sing Sing" grounds. Money would not buy these tusks, and if anyone, apart from the owner, dared to touch or disturb these greatly-prized treasures, it would mean instant death.

So important is a pig feast that the women (who, unfortunately, do not hold the same place in social and business life in those lands as in Christian lands) are not even allowed to have a hand in the preparation or cooking of it. In many of the Pacific islands the pig plays an important part, a man's wealth being reckoned by the number of pigs he possesses (the pigs are, of course, of less commercial value than here). In some of the Islands pigs are allowed to accompany the natives to their church ceremonies and to lie stretched at their sides whilst service is proceeding.

Dr. Fleming Jones, Chief Government Medical Officer in Papua, stated in a report recently, that pigs were treated with great consideration by the Papuans and are only killed for great feasts. It was quite common, he said, to see in the native villages women suckling a little pig at one breast, and a baby at the other.

The Chinese, one of the most ancient of the nations, are lovers of the pig, and the flesh is used freely, especially at their feasts. The Chinese are regular buyers at the Abattoir Saleyards in Sydney, and always buy up large numbers of pigs. In some instances Chinese buyers operate for well-known European firms. However, in comparison, possibly the greater number of the early races regarded the pig with disfavour and abhorrence: Why?

Possibly it may have arisen through the belief at one time prevailing that the pig's flesh transmitted "leprosy," for pigs were known in those days to suffer from a disease (no doubt due to lice, sun scald, &c.) resembling the human leprosy; or it may have been through the pig's voracious appetite and omnivorous (flesh-eating) habit, whereby possibly he carried into his body diseased as well as healthy flesh. Tuberculosis and other diseases would thus be distributed, for pigs, like other animals, are subject to this dread disease.

Of course, with our rigid system of food and meat inspection, we find it comparatively easy nowadays to reject diseased carcasses, and we understand the nature of these diseases, their cause and effect. We likewise know the flesh of the pig to be nutritive and wholesome, and in many lands—in Ireland, for instance—the pig receives equal, if not better attention than most of the folk who look after them. One prominent Irish enthusiast displays a notice over his pig sties instructing the pig man to "*Feed the pig first; yourself afterwards.*" Thus it is that the pig has been referred to as "*The Gentleman that pays the rent,*" "*The hog that*

made Chicago," "The Husbandman's best Scavenger," "The housewife's most Wholesome Sink," &c.

The pig, as we now have him, is a descendant of the wild hogs "*Sus scrofa*" and "*Sus aper*" which are indigenous to Europe, Asia, and Northern Africa; a comparatively refined white type coming originally from China, "*Sus indicus*," a different species, was used largely for crossing with the above and also with an earlier, black, offshoot of a species brought from Italy under the name of the "Neapolitan" in the production of our Berkshires and Yorkshires. The "Peccary" of America, a small rat-like pig, would appear to be the result of a degenerate type of the wild hog.

Colour and Other Characteristics.

In colour the wild hog was mostly a dusky brown with black spots or streaks. The skin was very thick, the hair bristly, and intermixed with a soft woolly undergrowth. He was lean, gaunt, gristly, much given to roving, very fleet of foot, strong and ferocious, but though so wild in his native state it is surprising how easily domesticated his offspring are, also how quickly they revert to the old type again if placed in a suitable environment. Thus sows farrowing out in the bush, the young ones become "wild" very quickly. Large numbers of these wild pigs may be found in the more remote districts of Queensland, New South Wales, and in New Zealand. In every instance they have reverted from the domestic type imported in the earlier days of colonial settlement. "Captain Cookers" these pigs are frequently called, this having reference to the offspring, run wild, of the pigs imported from England by Captain Cook and his successors.

The colour of any wild animal varies with the class of soil and the climate and environment he lives in; it may vary from a very dark or black to a very light grey or brown. The old wild pig was hunted a good deal both in Great Britain and on the Continent, as also in the western districts of our own country and New Zealand. "Pig-sticking" is there a common sport. At Queen's College, Oxford, the old Boar's Head Feast is still regularly an annual function.

However, with it all there is no food-producing animal which has contributed more largely to the food supply of mankind. The flesh is substantial and delicious, and is a favourite dish either in the fresh, salted, or dried or smoked (mild cured) forms. The edible portions of a pig's carcass affords a greater variety of dishes than any other animal.

The Modern Improvement.

Regarding the immediate history of the pigs we breed now, the old English wild boar, which is represented in the Tamworth and Large Black types, was domesticated and fed up to a fairly high standard, but it was a very difficult matter to improve them until the white type from China was introduced. These were a short, thick, fat type, of reasonably good quality, and when crossed on to the long, gaunt, gristly type of old England produced quite a different animal and one that responded very readily to good treatment. The Neapolitan type already referred to was also used at a later stage to introduce other useful qualities and the propensity to fatten more readily. These Italian pigs were long and somewhat boiler-like in form, low in the belly, and with a tendency to hollowness in the back; they were compact and thick in the limbs and carried a coat of soft silk-like hair, black or rich copper in colour. They were not so prolific as the Chinese or English type, but the progeny of these crosses readily became acclimatised and quickly gained popularity, and as opportunity offered (for transport was slow and difficult in those days) were distributed, and used in India, Japan, Borneo, Java, South Africa, New Guinea, and eventually, with the discovery of Australia and New Zealand, they came South. Careful breeding, feeding, and selection have been the main factors in their production, though very often in-and-in breeding has been resorted to.

Other Zoological Characteristics.

The pig is distinctly an omnivorous animal, that is, his digestive system is adapted to vegetables as well as fleshy foods. He has a single stomach, somewhat sac-like in shape, and has a rather long intestinal tract. In his natural state the food consists of all sorts of roots, nuts, worms and other flesh, grass, and succulent vegetation, &c. We utilise the waste food from the kitchen and garden, potatoes, turnips, and all sorts of root and similar crops, greenstuff, clover, peas cereals, acorns, bananas, and waste fruit generally, as well as milk and dairy by-products in his production.

Good grazing land with plenty of succulent herbage makes excellent pasture on which the pig loves to roam. The animal fattens rapidly on suitable food, more

readily than any other domestic animal. His senses are but slightly developed, except the sense of touch in the snout (which is very keen), sight, hearing, and smell are more acute in the wild than in the domestic pig. Though the eye is small, the pig can see long distances. The skin is comparatively thick, the growth of hair, varying with different breeds and with environment; thus in the warmer regions the skin is soft and almost free of the thick crop of hair which grows more readily in the colder climates where the skin is thicker and less sensitive.

A PECULIAR DISEASE AFFECTING THE EAR OF PIGS.

Some interesting research work has recently been carried out in New South Wales by H. R. Seddon, D.V.Sc., and H. R. Carne, B.V.Sc., of the Veterinary Research Station, Glenfield, which had as its objective the determination of the cause and effect of a peculiar disease, technically known as "Suppurative otitis" affecting the ear of the pig, the principal symptoms of which are the "abnormal method of carriage of the head and the interference with equilibrium and sense of direction. The disease, which, unfortunately, is all too common amongst pigs in Queensland, is featured in the "Agricultural Gazette of New South Wales," June, 1924. The reference the authors make to this disease is as follows:—

A condition has been noticed fairly commonly amongst young pigs in which the most prominent symptom is a peculiar alteration in the carriage of the head, which is accompanied frequently by unsteadiness of gait. The disease is seen usually in young pigs from a few weeks up to three or four months old. The reason for the relative infrequency of occurrence in older pigs is possibly that young pigs are more prone to catarrh (which appears to be the forerunner of the condition) and that affected animals suffer such loss of condition that they die or are killed as "runts" or "bad doers."

Symptoms.

The most characteristic symptoms are the abnormal method of carriage of the head and the interference with equilibrium and sense of direction. The head is twisted or rotated to one side or the other so that one ear (the affected one) is depressed, such depression becoming more marked as the condition advances. It is noticed that the animal when walking about tends to circle in one direction, this being towards the side to which the head is depressed. For example, if the left ear is affected, the head will be rotated to the left with depression of the left ear and "circling" will occur in the same direction. At times this tendency to circle is not apparent, but it is noticed that when moving the animal does so with an awkward gait, whilst the head is moved from side to side in an unbalanced manner. Affected animals may also exhibit considerable difficulty in going straight up to the feeding trough, having to make several attempts before gauging the right direction, sometimes walking to one side of the trough and sometimes to the other. It has frequently been noticed that the condition is accompanied by discharge from the nostrils and eyes.

In advanced cases there are very apparent disorders of equilibrium, the gait becoming unsteady and somewhat inco-ordinated, and the animals may fall into the feed trough and be unable to get out again.

Affected pigs are usually found to be "poor doers," showing a scurfy condition of the skin, lack of lustre of the hair, and poor condition. The appetite is capricious. In some cases examination of the affected ear reveals a considerable amount of yellowish brown or brown sticky discharge adhering to the inner surface of the ear.

Cause and Lesions.

Examination of several pigs showing such symptoms has revealed the presence of a suppurative condition affecting the middle ear, and this may be the only demonstrable pathological change found on post-mortem examination.

The hearing apparatus, it may be mentioned consists essentially of three parts:—

1. The external ear, which is that portion visible externally. Its function is to collect sound waves and transmit them by means of a passage to—
2. The middle ear.—This is separated from the external ear by the tympanic membrane or "ear-drum." The function of the middle ear is to magnify the sound waves collected by the external ear and transmit them to—
3. The internal ear.—This consists of an intricate structure by which the sound impressions are transmitted to the sensory areas of the brain. The internal ear,

however, performs another very important function—namely, the maintenance of equilibrium, it being by means of part of this structure that an animal keeps its balance. Disease of these deeper structures of the ear, therefore, frequently leads to an unsteady gait, twisting of the head to one side, or even to inability to stand at all.

Both the middle and internal ear are situated within the petrous-temporal bone of the skull and it is within this bone that the lesions responsible for the condition are found. The petrous-temporal bones are placed immediately behind the articulations of the lower jaws and the skull, but a careful dissection by sawing open the skull along the longitudinal mid-line and removal of the brain is necessary to expose them properly.

In several cases so examined it has been found that a thick cheesy material is present in the cavities of the bulbous portion (bulla ossea) of the middle ear on that side to which the head has been depressed during life. Nominally these cavities in the bone have a honeycombed appearance consisting as they do of small empty spaces separated by thin plates of bone.

The accumulated pus in the middle ear tends to burst through the ear drum and discharge externally, giving rise to the sticky discharge which may, in advanced cases, be seen on examination of the passage in the external ear.

Examination of the pus shows the presence of bacteria, such as are commonly met with in other suppurative conditions in the pig. It is probable that in these cases they gain entrance to the deeper structures of the ear by way of a narrower passage (called the Eustachian tube) which leads from the back of the throat to the middle ear, and from the comparative frequency of nasal catarrh in young pigs, it is probable that this ear disease is an extension of this inflammatory process affecting the lining membrane of the nasal passages.

Prevention and Treatment.

Once the condition is established it is unlikely that any treatment will be of use. Syringing of the outer ear will remove the obvious discharge, but will not penetrate into the deeper structures from which the pus arises. While the discharge cannot be definitely prevented, all possible means, such as proper attention to cleanliness and housing, should be undertaken in order that chills may be avoided. Diet should also be attended to, as it is found that this also plays a not unimportant part in the causation of those diseases, such as catarrh (snuffles) and pneumonia, with which the condition is frequently associated.



PLATE 126.—STANTHORPE DISTRICT FRUIT EXHIBIT, BRISBANE SHOW, 1924.

ABSTRACTS AND REVIEWS.

All foreign agricultural intelligence in this section, unless otherwise stated, has been taken from "The International Review of the Science and Practice of Agriculture," published at Rome by the International Institute of Agriculture.

The Scrub Bull—Efforts to Eliminate Under-bred Sires.

M.C., "The Farmer and Stockbreeder" (U.K.) No. 1820, Vol. XXXVII., N.S., August, 1924.

Is the scrub bull to go the way the mongrel stallion went? The latter was banished from the roads years ago, and the gain to horse-breeding and to horse-breeders has been of no small account.

The problem of the inferior sire in relation to cattle is wider and more complex than in reference to horses. Whereas stallions are seldom kept for exclusive use on the owner's farms, but are travelled for hire in districts near to or distant from the home of the owner, the converse applies to bulls; they are retained almost entirely for service in the home herd, or if they are used by others than the owner, such service is on a limited scale. In considering the general question of inferior sires, therefore, it is necessary to take into account the circumstances that apply to each class of stock and to examine the subject from the particular angle applicable.

Compulsory Use of Pedigree Bulls.—In Scotland there is a strong and growing feeling that the non-pedigree bull should be debarred from propagating his kind. The idea has wide support in England and Wales also. Indeed, some years ago a definite proposal was made that compulsory powers should be sought to prohibit the use of under-bred sires—the kind of bull that is unfit by breeding and individual merit to beget calves suitable for rearing. Bulls of the type indicated are plentiful, and known in most districts. The best breeders do not want them, and the country is the poorer because of their presence. It is the common supposition that dairy farmers are the worst offenders in the matter of inferior bulls, but they are not the only defaulters. In all parts of the country there are abundant evidences of negligence regarding the class of bull kept. Even when the progeny are to be retained for replenishing the herd the influence of the sire is not always sufficiently recognised, and the quality of the stock suffers in consequence.

The chief culprits are the breeders who do not intend to rear the calves; the owners who look upon calves as cumbersome by-products in the business of milk production. In these cases the calves are sold at or shortly after birth for what they will bring. Often they are slaughtered while still wastefully immature, but a certain proportion find their way into the possession of farmers who make a point of rearing young stock, either to be fattened off at six months or less, or run on as stores to be sold to the graziers at two or more years old. Whatever the fate or the future of the calf, serious waste results when its sire is of a defective class. The dam is not unimportant by a long way, but presumably she is of passable merit, or she would not be retained and bred from. In any case, the question under discussion in many parts of the country is that of the bull, and it is well that there should be concentration upon one aspect of the broad subject at a time.

Value of Well-bred Animals.—The vital influence of heredity even in ordinary commercial animals is quickly discernible. At the recent Conference at Edinburgh, it was suggested that whatever improvement was noticeable in cattle in the past generation may have been attributable as much to better methods of feeding as to the more careful selection of the parent stock. Experienced farmers who keep an accurate record of the cost of feeding will not endorse this view. Much has been learned regarding the use of feeding stuffs in the past thirty years, but whatever benefit has accrued to farmers has come to them in the form of quicker returns or reduced expenditure; it has not altered in the smallest degree the relationship of the merits of well and ill-bred animals. The bullock bred from good stock, such as would be approved under any acceptable scheme of bull selection, still fattens as rapidly, cheaply, and easily as compared with the descendant of the mongrel bull as he ever did. And, in addition, when he is fat he sells more readily and brings a higher price per lb. If there is to be appreciable improvement in the common cattle of the country, a start must be made with the breeding of the animals, and as the number of bulls is smaller than that of cows, and the influence of the sire larger in inverse proportion, it is clear that the bull is the proper point for attack.

Difficulties in the Way.—While the existence of defects can be readily detected, however, it is not so easy to suggest or devise effective remedial measures. At a meeting of Scottish breeders various proposals were discussed, but it was decided to refer fuller consideration of the general question to a committee. Opposition was raised to the proposal to restrict selection to registered sires. In the case of the

Shorthorn, for instance, it was explained, this course would exclude a large proportion of the excellent Cumberland cattle, than which for certain uses there are no better in the country. The non-registered Shorthorns of the Lake Counties are for the most part as carefully bred as the herds in the breed register, but they are without herd book numbers. To exclude them from acceptance under a Government or voluntary scheme would be a great mistake, and could not be justified on any reasonable ground. In respect to the purely territorial breeds, compulsory measures might be applicable; but the position is more difficult in regard to the more widely distributed varieties. It is probable, however, that compulsion will be resented and resisted, even if the importance of the issues involved should justify drastic action. How the idea is to be made effective is a problem that will exercise the most ingenious minds for some time. The importance of the question will justify a bold attempt to solve it, however, and the Scottish farmers have tackled the task with a determination that encourages hope of ultimate success.

Goodwill of Farmers.—Even when the best organisation conceivable has been devised, the full results will be obtained only with the co-operation of the farmers concerned. The individual breeder will have to work out a plan on a different basis from that usual in the past. It will not be possible, it is to be feared, to help the owner who declines to help himself, or to take an active part in the process of grading up his cattle. With the goodwill and appreciative collaboration of the farmer, he would soon be able to perceive the advantage of using well-bred bulls, and the economy of paying the slightly higher price for a bull that would beget good calves. When this part of his education has been completed, the rest will be simple. One of the first things to aim at, therefore, is to induce recognition of the principle that there is need for improvement, and then to prove that by a comparatively simple and speedy process, involving no great expenditure of capital, the desired improvement can be effected.

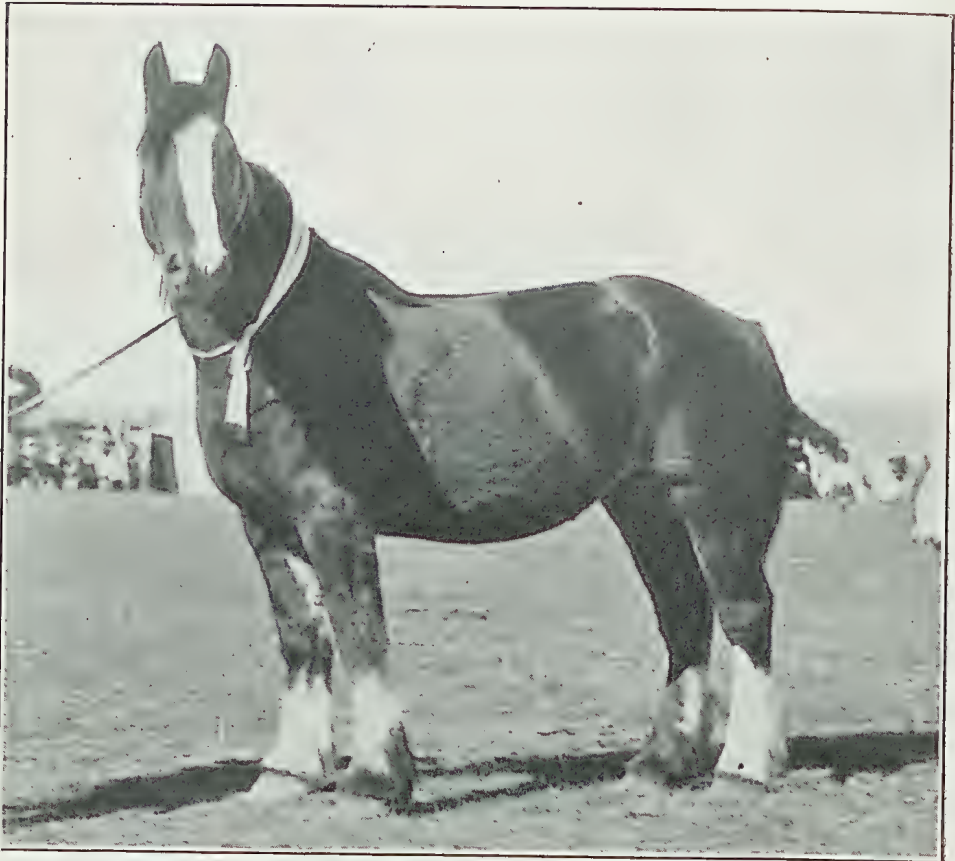


PLATE 127.—CLYDESDALE MARE, "JEWEL."
(Sire, Hero—Here I Go; Dam, Bonnie—Rob Roy).

Winner of Three First Prizes and Champion, Murgon Show, 1923. Bred by, and the property of, E. A. Hancock, Murgon.

THE MAIN ROADS BOARD.

THIRD ANNUAL REPORT.

In Queensland in recent years there has been a marked development of roadway construction from a casual activity in the hands of untrained men without programme or plan, other than to maintain a minimum of convenience and facility for ordinary traffic, towards a reasoned industry in the hands of competent engineers, supplemented by intelligent local help. This is part of the forward Government policy of making country life more attractive, and its aim is to provide in rural districts complete and economical traffic service. The Main Roads Board is a medium through which much substantial progress is expected, and the subjoined extracts from its Third Annual Report, together with the plates illustrating its activities, convey a good impression of the scope and importance of its work.—Ed.

Importance of Correct Design of Road.

The preliminary work of road design is a most important one, for it is necessary to consider proposed works from the point of view of the long loan period specified in the Acts, hence the road constructed must be of such a character that it can be maintained in good trafficable condition for a long period at a minimum cost; whilst on the other hand it would be wasteful to pave it to too great a thickness, or under certain conditions of traffic and soil to pave it at all. The classification by the engineer of the bearing quality of the foundation and class of traffic which may be expected is, therefore, of great economic importance. As an example, there are many varieties of black soil, some requiring under heavy loading condition a consolidated thickness of up to 15 inches of paving material, whilst others may contain a proportion of sand (black sandy loam) when 9 inches or less of paving material might be sufficient. A mistake in classification would thus easily increase the cost of paving by 66 per cent.

In order to avoid either errors involving excessive thickness of paving material on the one hand or too small a thickness on the other, which would result in rapid disintegration of the road, the surveyors' classification of soil is checked with the Board's original notes when the road was first inspected, and where any doubt exists the district engineers make further check classification and remodel the design where necessary.

The thickness necessary for various soil classifications and traffic conditions are indicated in the appendix to the Board's first Annual Report. This classification is being extended, and actual samples of soil for comparison purposes are being collected and mechanically analysed, so that when any doubt exists as to the bearing capacity of the soil it may be compared with soils of known capacity.

The value of materials close at hand and of any use for paving must always be considered before deciding on the use of more durable material which may have to be transported long distances. This requires judgment as to the possible life of each class of material and, where no previous knowledge of the behaviour of the materials exists, it is the Board's practice to have rattler tests and microscopic examination conducted at the University.

In the case of bridge design, the problem of what material it should be constructed must necessarily be first decided, and the principles were enunciated in the first Annual Report, page 9. Yatala Bridge over the Albert River in Beenleigh Shire is a case in point. Designs in reinforced concrete and timber were prepared, and the following extracts from a letter from the Board to the Council will serve to illustrate the importance of the subject:—

MAIN SOUTH COAST ROAD—TENDERS: YATALA BRIDGE.

The lowest tender for concrete construction is £14,009 16s. 6d., and for timber £5,790 12s. 9d.

When maintenance and renewal funds are capitalised (on the basis of renewals in timber at twenty-year periods, and calculating that the first renewal will cost 50 per cent. more than present costs, and on the basis of a



PLATE 128.—REDCLIFFE ROAD. COMPLETED SECTION CONSTRUCTED WITH TRACHYTE METAL FROM BEERBURRUM.

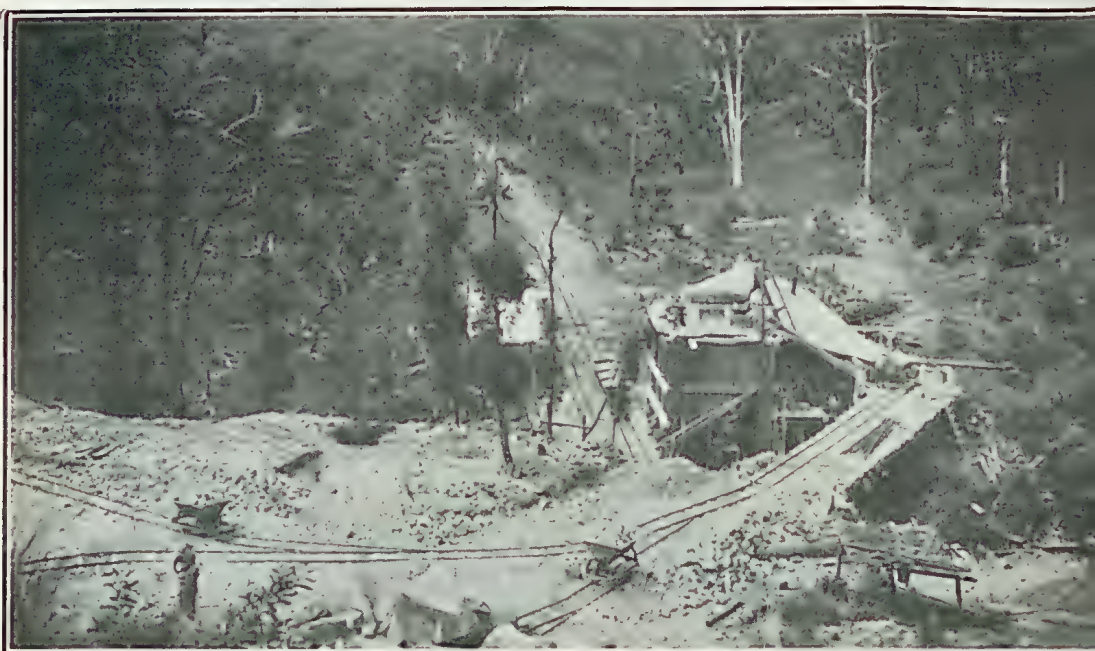


PLATE 129.—QUARRY PLANT AT BEERBURRUM, SHOWING LIGHT TRAMWAY CONNECTING WITH NORTH COAST RAILWAY. HAULAGE IS BY MOTOR CYCLE ENGINE ON A TRUCK FRAME.



PLATE 130.—BUTCHER'S CREEK BRIDGE AND SECTION OF NEW ROAD ON THE EVELYN TABLELAND, NORTH QUEENSLAND.



PLATE 131.—CLIFTON-PILTON ROAD, CLIFTON SHIRE, OVER BLACK SOIL ON DARLING DOWNS.

fifty-year life for concrete), the result is in favour of timber construction by an amount of £1,682, whilst if capitalisation on the basis of building a timber bridge at present and renewing in twenty (20) years with concrete is considered, the difference is still more marked in favour of timber construction at the present time—viz., £2,145.

Furthermore, at the end of the life of a timber structure erected now, concrete construction will, in all probability, have improved so much that a better bridge at cheaper cost would result, and also would give the opportunity of erecting a wider and even stronger bridge if traffic so demanded.

This method of dealing with this structure will also leave available £8,219 for present or near future needs of other portions of the South Coast Road.

Approval is therefore now granted to the acceptance of the tender of £5,790 12s. 9d. for a timber bridge.

In numbers of other cases the concrete structures have been decided on in the light of similar analyses, as each case must be dealt with on its merits.

Increasing Demand for Good, Well-graded Roads and Bridges.

The need for better roads becomes more pressing each year with the advent of motor transport and the increase in the area of dairying operations, wheat, lucerne, and cotton-growing, &c.

Areas, which but a few years ago were regarded as being too far from a railway or port for economic development, can with present-day transport facilities be profitably farmed if they are but served by decent roads; in fact, under modern transport conditions, the haulage cost per ton-mile falls more rapidly as the distance increases than under the old conditions.

Average costs in this State for motor haulage on good roads are approximately—

1-mile journey, 1s. 9d. per ton-mile;

11-mile journey, 10d. per ton-mile;

whilst in Southern States the cost for a 50-mile journey is as low as 6d. per ton-mile where the roads are good.

When this is compared with the rates of 1s. 6d. or more per ton on a 50-mile journey over rough, boggy, and ungraded roads, it will be readily realised how powerful a factor the good road will become in rendering it possible to farm lands at considerable distances from the railway—lands which otherwise would remain in their primeval state, or at best be used only for grazing.

Very great reduction in haulage costs are often effected by the construction of a comparatively short section of road which has been perhaps too steep or a quagmire for months in the year, or perhaps consisted of heavy sand. The construction of a deviation less than one mile in length in the Kilkivan Shire, designed to avoid a very steep hill, is such an example, and has undoubtedly increased the capital value of the land served by an amount equal to many times the cost of the work.

It is considered necessary to enunciate again certain principles in the Board's road-making policy, for it is apparently still presumed by certain Local Authorities that every foot of a gazetted road is intended to be macadamised. This is not so in the majority of cases. Miles and miles of those roads gazetted will need little in the way of permanent works, other than clearing and draining, for many years to come. In the Western country, as previously pointed out, only creek and river crossings, or fords and floodways, will be dealt with.

Even in the more closely settled areas of the Darling Downs, where the roads have to carry heavy wheat traffic, the only sections requiring urgent attention are those on the heavy black soil. The reddish black soils form fair natural surface roads.

On the other hand, relocation and grading of mountain sections in farming districts is essential.

The occasional misstatement that interest and redemption charges on works constructed by the Board are not equal to the saving on the cost of haulage or other advantages is discounted by the clamour of Local Authorities for more and more Main Road works. In any case, it takes no account of the great social advantages of the good road.

As sections of roads are made trafficable in all weather, the farmer or dairyman will not require to let his produce rot in the paddocks whilst waiting for the boggy roads to dry before carting can be resumed.

In the Springbrook area the farmers have produced evidence to the Board that one-third of the cream produced had been graded as second class, resulting in a loss of twopence per lb., or a gross loss of £645 per annum, due entirely to bad roads. Cream, which is half churned before it reaches the factory and which is exposed to the sun for hours longer than necessary, due to bad roads, is graded lower and is a direct loss to the individual and to the country.

Only three local authorities in the State have so far objected to the Board's proposals, and in only one case has it been considered advisable to recommend that work be undertaken against the wishes of the Council.

Some of the least developed areas in the State lie immediately behind the coastal range, and it is hoped to gradually develop these areas by roads leading to the nearest railways.

The schemes at present in hand tending towards such developments are:—Sarina-Nebo road, Collinsville towards Mount Coolan, and Cairns-Tableland road. Several others, such as roads in the Mary Valley, to the west of Maleny, and Montville should be undertaken as early as funds can be made available.

The practical value of proper location on easy gradient and of deviations which eliminate stream crossings has now been well demonstrated on completed sections of roads, such as Landsborough-Maleny, Tambourine Mountain, Rathdowney to Mount Lindsay, and Marburg-Frenchton, whilst the construction of a number of bridges, at present in hand or about to be commenced, will be of great value.

The chief of such are shown in the table hereunder:—

	Length.	Type.
Yatala Bridge, over the Albert River	3 40 ft. and 6 30 ft. = 300 ft.	Double girder timber
Bowen River Bridge, near Collinsville	12 30 ft. and 440 ft. causeway	Timber; low level with concrete causeway
Herbert River Bridge, near Ingham	450 ft. 	Timber; low level; designed also for tramway
Beatrice River Bridge, near Millaa Millaa	2 25 ft. and 1 70 ft.	High level; composite truss and concrete piers
Burrum River Bridge, near Howard	310 ft. 	Low level; reinforced concrete
O'Connor's Crossing, Lockyer River, near Gatton	5 25 ft. 	Timber; low level
Boyne River Bridge, Mundubbera Shire	300 ft. 	Timber; low level
Baffle Creek Bridge, Miriam Vale Shire	275 ft. 	Timber; low level
Hulbert's Crossing Bridge, Wyangarie Shire	200 ft. 	Reinforced concrete
Palen Creek Bridge, near Rathdowney, Beaudesert Shire	3 35 ft. 	35 ft. double girder spans in timber

Transport and Excavation of Road-making Materials.

Whilst there is a wide range of good road-making material varying from mixtures of sand and clay, gravels, metamorphic and igneous rocks in the State, yet often they are not available close to the works, and transport to the road becomes an expensive and difficult matter.

In many instances the Board has been compelled to construct light tramways for hauling quarried metal to the crusher, or from the crusher to the railway. Some of these tramways are gravity operated, as at Lowood, and Jim Crow, near Rockhampton.

On others, where the grade undulates and is somewhat steep, horses are employed to haul the trucks.

At Beerburum, the crushed metal is hauled three-quarters of a mile by petrol locomotives (constructed from ordinary side-tipping truck frames and motor cycle engines) to the railway, and is thence distributed by rail. This metal, where supplied for the Redcliffe road, has to be hauled distances up to 11 miles by motor truck or traction engine after it is unloaded from the railway.

At Sarina, the metal will be hauled by locomotive over the Plane Creek Sugar Mill Tramway to various points.



PLATE 132.—HAMPTON-ESK ROAD READY FOR METALLING, CLIMBING THE MAIN RANGE.



PLATE 133.—MACADAMISED ROAD RECENTLY CONSTRUCTED ON THE ATHERTON TABLELAND, NORTH QUEENSLAND.



PLATE 134.—BOARD'S BITUMEN HEATER AND SPRAYER.



PLATE 135.—BEADESCERT SHIRE. A DEVIATION ON THE BRISBANE-MOUNT LINDESAY ROAD WHICH AVOIDS FOUR CREEK CROSSINGS.



PLATE 136.—KINGAROY SHIRE. MACADAM ROAD WITH RUBBLE SHOULDERS.



PLATE 137.—DEGILBO SHIRE ROAD UNDER CONSTRUCTION AWAITING TOP COURSE METAL.



PLATE 138.—GOOBURRUM SHIRE. NEW ROAD NEAR BUNDABERG DURING CONSTRUCTION.



PLATE 139.—LOWOOD QUARRY, SHOWING A PASSING LOOP ON THE GRAVITY CABLE TRAMWAY LEADING FROM QUARRY TO CRUSHER.

The employment of tipping motor trucks of an average capacity of three cubic yards is proving the cheapest method of transport where the leads exceed one mile, and they may be more economical than horses and drays on still shorter leads if special arrangements are made for quick loading.

Tractors have been employed successfully in lieu of horses for ploughing, scooping, and working graders in a number of instances on Board works.

The employment of manual labour in earth-moving cannot be too strongly condemned in most cases. The men are much better employed in handling scoops, ploughs, graders, &c., although, of course, certain operations, generally a minor part of the work, do require manual labour.

The heavy cost of moving rock-crushing plant to small jobs often outweighs the saving of the mechanical breaking, and it is frequently necessary for the Board to combat the desire of the Council to start small job work on several roads simultaneously.

Wherever extensive and extended quarrying operations have been commenced, the Board has provided air compressors and rock drills, and these have also been employed wherever extensive rock cuttings have been made, but it is obviously impossible and indeed uneconomical to provide such machinery in every job irrespective of the amount of quarrying and rock cutting. Many Councils have failed to look at the matter in this light, and have made unwarranted criticism even whilst failing themselves to provide the smallest item of plant.

During the year the Board has considerably strengthened its power rolling plant (10 to 14 ton rollers), which now consists of six steam and four Diesel rollers. Quicker and better consolidation of surfaces has resulted; animal drawn 5-ton rollers are also fully utilised.

WORKS IN VARIOUS DISTRICTS.

Darling Downs and Western Area.

It has been found on the Darling Downs that much of the surface stone or outcropping boulders of basalt provide a very good class of road metal for top course, and the most economical way to handle such stone is to create depôts near the road. It is often necessary to accumulate the whole quantity of stone required for a section before crushing is commenced, as otherwise the supply to the crusher could not be maintained after wet weather, owing to the impossible state of the tracks over which metal must be carted.

Operations in the vast Western Downs of the State are necessarily restricted to the construction of bridges, culverts, fords, or floodways, for the sparsely populated nature of the country and great mileage of the roads would not warrant attempting to macadamise or gravel them.

The class of work first mentioned is, however, very necessary, as without such improvements traffic would be held up for weeks at a time. Traffic is, of course, almost impossible in any case on black soil plains for a day or so after rain. Works of the above character are in progress in Winton, Longreach, Wyangarie, Mackinlay, Cloncurry, Adavale, Wambo, Taroom, and other Western Shires.

North Queensland (Tablelands).

On the Tablelands of North Queensland, the need for good roads is a matter of vital importance, for traffic is maintained only with difficulty on unmetalled or ungravelled roads over the rich volcanic soil during the wet season, which lasts generally from four to six months in the year.

A great deal of the Board's energies in the North have been concentrated on the problem of ameliorating those conditions by the construction of practicable gradients (not steeper than 1 in 20) and by macadamising sections of road.

The completion of the road leading from the coast, near Cairns, to the hinterlands, and rising 2,600 feet in 12 miles on a compensated gradient of 1 in 20, will be a red letter day in the history of road-making in North Queensland. This work is being carried out under the Commonwealth Main Roads Development Act. The location and working surveys on this route kept occupied three survey parties for nearly twelve months, and entailed considerable hardships on their part, owing to the roughness of the range and lack of communication, wet weather, &c. Over 5 miles of the range section have been completed, and some 7 miles of earthwork between Yungaburra and the top of the range extended to meet it. Grading and metalling works are in progress or completed in the vicinity of Atherton, Yungaburra, Millaa Millaa, Pearamon, and Ravenshoe.

Sugar-producing Areas.

In the sugar districts, economical transport of cane by narrow gauge tramways has been secured, but lack of roads is none the less keenly felt. In some areas farmers are unable to reach their homes excepting by "rail pump car," whilst in others the existing tracks are quagmires in the wet seasons.

Isolated cane areas adjoining the larger areas do not warrant the construction of tramway, and farmers are pressing for roads so that cane may be transported by motor truck.

The Board has in hand the construction of many miles of roads in the Cairns, Innisfail, Ingham, Ayr, Townsville, Mackay, and Sarina districts, and, invariably, the greatest problem in these areas is the provision of suitable paving material at reasonable cost. At Ingham a bridge 475 feet long and approach roads is being constructed over the Herbert River, which will make available sugar lands on the north side of the river. At Ayr a good type of sand-clay road is being constructed, no local metal being available. The work has been well organised by the local Shire Council, and practically no other plant except the Council's is being used on the job.

Central Districts.

Construction is well advanced in the Rockhampton district, and the roads will chiefly benefit the dairyman and cotton-grower.

Much of the country is brigalow and coastal scrub, which requires considerable grading to eliminate the large melon holes. Rubble metal (C class) is most generally employed for surfacing, but some miles have been paved with crushed stone in addition. The provision of waterways greatly increases the cost of construction in this area. Examples of good roads constructed twenty-five to thirty years ago, and before the formation of shire councils, exist in this district. Even to-day they are in good condition, and are a fine illustration of the value of permanent work, and are in contrast with the average work of shire councils as performed to-day. Parliamentary records indicate that even as far back as 1860 roads were being constructed in Queensland at a cost of £6,000 to £7,000 per mile.

In the Gayndah and Mundubbera district a number of miles of macadamised roads on the black soil country were completed, and work is being steadily pushed forward. The Gayndah conglomerates are being largely utilised on certain roads. The erection of a timber low-level bridge over the Boyne River will, it is hoped, be shortly commenced, and will prevent the frequent interruption of traffic from the dairy farms to Mundubbera Butter Factory.

The Mundubbera-Gayndah-Goomeri-Kingaroy-Kumbia road is one of the longest and most important main roads in the State, and works are in progress on various sections throughout its length, whilst very good progress is being made on the branch leading from Ban Ban Springs, through Coalstoun Lakes-Biggenden-Dallarnil to Childers. The work in this branch has been completed for 9 miles, and consists of clearing, regrading, gravelling, and the provision of small bridges and inverts.

In the Murgon and Wondai districts good progress was made, and here again conglomerates and gravels have been utilised for paving.

The formation of Murgon-Boat Mountain road, on a new location with a gradient of 1 in 20, will shortly be completed. Similar work on new locations has been completed on Murgon-Windera road.

All these roads are of great value to the grower of maize, cotton, and dairy produce, and provide easy means of intercommunication between various centres. Some miles of macadamised roads have also been completed in Gooburrum and Burrum Shires.

Southern Coastal Areas.

The roads operated on are those leading either from the railway towards the coast in the dairying, sugar-growing, and fruit areas, or leading up the Blackall Range from the coast, such as the Landsborough-Maleny road. A considerable section of this latter road, which involved heavy cuttings, stone wallings, and heavy macadamising, is in use.

Operations on the Redcliffe road were hurried on as fast as funds available would permit, and shut down early in the year, the traffic having been since carried over the bottom course for some miles. Work has now recommenced.

Some 3 miles of the Brisbane-Ipswich road have been recently thrown open to traffic, and two reinforced concrete bridges and a number of culverts have been completed.

A section of the above road at Goodna has been bitumen-surfaced with good results, and the 3-miles section is being similarly treated.

Southern Area.

The Rathdowney and Mount Lindsay road works have made considerable progress. Some miles have been macadamised with ferruginous sandstone, and although sections have been carrying heavy timber-wagon traffic for eighteen months there is hardly a mark on the surface.

This road, part of which is being constructed under the Federal grant, is destined to become a great interstate route, and the market road for a considerable distance around Urbenville and Woodenbong, in New South Wales, thereby bringing produce to the Beaudesert Tramway.

One deviation in this work eliminates five crossings of Palen Creek. Several small bridges and one larger bridge over Palen Creek have now been completed.

The mountain section of Tambourine Mountain road, one of the most difficult works so far undertaken, has now been completed. It rises to a height of 1,800 feet above sea-level.

Macadamising and regrading is in progress on Beech Mountain-Canungra road, and two sections of Beenleigh-Tambourine road have been completed and opened for traffic.

Sections of road in Normanby and Tarampa Shires on the Warwick road and Gatton-Mount Sylvia road were completed, whilst the Lowood-Forest Hill road in Esk Shire is being macadamised.

The new gradients between Marburg and Frenchton and Hampton and Esk were completed during the year, and are now being macadamised.

O'Connor's bridge, over the Lockyer, on the road between Gatton and Helidon, is nearing completion.

A number of sections on the heavy black soil of the Darling Downs, leading traffic to the railway stations, have been completed in Clifton, Cambooya, Glengallan, and Allora districts, and some miles of the Allora-Warwick road have now been completed.

Considerable lengths of regrading and granite sand surfacing have been completed on gazetted roads in Stanthorpe Shire.

MAINTENANCE.

With the construction of sections of new road it is necessary that they shall be maintained, and it becomes increasingly necessary to place other sections of old road in more serviceable conditions, and to eliminate pot holes on unconstructed sections. As soon as possible after the end of the financial year local authorities are advised of the amount of money which the Board has allocated for each road, and they are required to submit a schedule of proposed works. Local authorities are encouraged to provide for additional maintenance work out of their own funds if possible to supplement the Board's work.

Much greater attention to maintenance work of a proper standard has been given by the local authorities during the past year, and the methods of work set forth in the second annual report have in most instances been followed.

On a considerable mileage of road, the Board has carried out gravel resheeting work of this character with its own plant and gangs. The Main South Coast road and Redland Bay road has thus been considerably improved at a comparatively low cost.

Waterford Shire has carried out much excellent maintenance work on Beenleigh-Tambourine road.

Attention to drainage, repairs to culverts, and extensive bridge maintenance has been carried on throughout the gazetted roads. Several roads carrying traffic into metropolitan and provincial city areas have been surface treated with tar and bitumen.



PLATE 140.—JACKSON'S CREEK BRIDGE, SARINA-NEBO ROAD. TYPICAL TIMBER BRIDGE.



PLATE 141.—SECTION OF SARINA-NEBO ROAD, MACKAY DISTRICT.



PLATE 142.—GAYNDAH—BINJOUR—MUNDUBBERA ROAD FIRST MACADAMISED SECTION OVER BLACK SOIL.



PLATE 143.—TYPICAL REINFORCED CONCRETE BRIDGE.



PLATE 144.—NEW ROAD UP TAMBOURINE MOUNTAIN.

THE DAIRYMAN'S VETERINARY CHEST.

Every dairy of any standing possessing valuable stock should be kept supplied with the following drugs, kept in a locked cupboard, each separate kind being distinctly labelled to avoid mistakes:—

Purgatives and Laxatives—

- 10 lb. Epsom salts.
- 1 lb. ginger.
- 1 gallon raw linseed oil.
- 1 quart castor oil.

Applications to the Udders and Teats—

- 1½ pints olive oil.
- 1 lb. lard.
- 1 pint camphorated oil.
- 1 lb. vaseline.

Bloating—

- 1 pint turpentine.

Disinfectants—

- 1 lb. carbolic acid.
- 1 lb. boracic acid.
- 1 gallon zenoleum, creolin, or izal.

Tonics and Stimulants—

- ½ lb. sulphate of iron.
- ½ lb. gentian.
- 1 pint whisky or brandy.

In addition to the foregoing, the following appliances for treatment of disease and the administration of medicines can profitably be included:—Drenching bottle with long neck, trocar and cannula for bloating, graduated measuring glass; milk fever apparatus, clinical thermometer, injection pump, or 6 ft. ½-in. rubber hose with glass funnel, hard rubber syringe, three milking tubes and set of hand clippers.—“Country Life and S.S. Journal” (Sydney).



PLATE 145.

Fruit Packing Instruction in Northern Coastal State Schools by Departmental Officers has been followed by the formation of Fruit Packing Clubs by enthusiastic scholars in every Orchard Centre. Competitive exhibits were staged at the last Brisbane Show and attracted much attention and stimulated greater interest in this phase of effective fruit marketing.

General Notes.

Northern Fauna Sanctuaries.

The recreation reserves at Lakes Eacham and Barrine, in the parish of East Barron, have been declared sanctuaries in which it shall be unlawful to take or kill any animal or bird.

The Californian Citrus Case.

As one result of the Conference of Ministers of Agriculture held in Sydney recently, the Californian citrus case has been included in the list of fruit cases to be used in Queensland. This case is 23 inches long by 11½ inches wide by 11½ inches deep, and has a central division, measurements to be clear of all or any division. The case should have a capacity of not less than 3,041.75 cubic inches.

Staff Changes and Appointments.

Constables V. J. Quinn and W. J. Barrett, stationed at Evergreen and Arrilalah respectively, have been appointed Inspectors of Slaughter-houses.

Mr. P. Rumball, Supervisor and Poultry Instructor, Soldiers' Settlements, Mount Gravatt and Enoggera, also Supervisor, Soldiers' Settlement, Highlands, has been admitted to the Professional Division of the Public Service and appointed Poultry Expert, Department of Agriculture and Stock.

Pests Declared.

The Mock Olive, Cape Gooseberry, and Devil's Apple, also the Apple of Sodom, have been declared to be pests within the meaning of the Diseases in Plants Acts within the Stanthorpe Fruit District, described as under:—

“All that part of the State enclosed by the southern border and lines commencing at Cullendore Crossing on the border, passing through Silverwood, Mountside, and Granite Hill, and then due west through Gore to 151 degrees 30 minutes meridian; and thence south along the meridian to the border.”

The Price of Grain Sacks.

The price of sacks for maize and wheat is pressing heavily on primary producers in Queensland, and particularly with maize, which is at a low price. In Sydney a recent advance was made of 3d. to 15s. 6d. a dozen, spot and forward. The “Sydney Morning Herald” says:—“The country and interstate demand was unabated in strength. When asked if there was a likelihood of such a position as the present high rates denoted occurring again, a merchant said that the remedy lay in the farmers' hands. If they liked to take the risk of buying sacks in July there was no possibility of them being squeezed for their supplies in October. At present the merchants took all the risk, and if they did not receive orders in July they bought only a limited number of sacks. Farmers could have bought last July at 11s. 6d. per dozen, he said, and if they were so inclined they could now buy their next season's supplies. Woolpacks were quiet at 5s. 6d. each, spot and forward, and bran bags were dull at 7s. 9d. per dozen prompt and 8s. December delivery.”

Unequal Compression Trouble.

Throttled down or driven at low speeds the engine ran perfectly, but when the speed was increased to 15 miles an hour or better, it would run unevenly. The valves had been ground and appeared all right. The spark plugs were changed and a test showed a good spark was being delivered at each plug. The ignition system was gone over and the points found in good shape, with all parts apparently in good working order. Changing the carburettor adjustment from a maximum to a minimum of richness of mixture proved unavailing. The push rods and rocker arms of the valves were in perfect order and yet the trouble continued. Finally testing the compression was tried, and one cylinder registered 60 lb., another 50 lb., and the other about 40 lb. each. Evidently here was the secret of the trouble, but what caused this unevenness of compression? Our problem was to locate it, and it was found due to weakened valve springs. The valves were not closing tightly nor quickly enough.—“Country Gentleman.”

The Age of a Sheep.

The teeth are a fair criterion of age, but like those of human beings, sheep's teeth last well in some cases, and go quickly in others. Merinos' teeth in Australia grow long with age, but in Lincoln and other longwool breeds and crosses it is found that they often wear short.

In a general way a sheep cuts its first two incisor teeth at sixteen months, the next two at twenty-four months, the next two at thirty months, and the final two incisors about two months later. These ages by teeth apply to early country, such as all the western portions of New South Wales, but in the eastern division they get their teeth later.

To tell five years from six and six from seven requires considerable experience, but, generally speaking, it will be found that the width of the outer two incisors is a good criterion.

It is not generally known that sheep cut their wisdom teeth at about sixteen months old, and this no doubt entails considerable pain, as it does in man, and is one of the reasons why it is so difficult to fatten hoggets.

Tanning Hides.

Tanning hides by the method described below is an easy process, according to a member of the Butter Branch of the South Australian Farmers' Bureau, and takes very little time:—First, the hide should be put in a mixture of lime and water, so that the hair can be scraped off easily. The hide should then be laid on a flat and clean surface and scraped on both sides to take off the hair, fat, meat, &c. It should then be left in clean water until the tan liquid is ready. The liquid consists of one 4-gallon bucket of wild peach or quondong bark added to 20 gallons of water. When cold, the hide can be immersed in the solution. Care should be taken that the tan is not too strong until the hide commences to show the colour of the liquid. Then the liquid can be made as strong as possible by adding more scalded bark. The addition of three buckets of bark will in most cases prove sufficient. All that remains to do is to air the hide once a week. The process will take three to four months. Care should be taken when airing the hide that it is not allowed to become dry and stiff. When the hide becomes heavy it is a sure sign that it is nearly tanned. After the hide is tanned, it should be washed in two or three waters, but not allowed to become dry until the dressing is applied. When the tanner is applying the dressing—a mixture of mutton fat and beeswax—the hide should be hung over a rail, and the dressing well rubbed into the leather on the flesh side with a block of wood. The hide can then be left to dry until required for use. If the dressing is not applied, the leather will become hard and wrinkly, and will stretch, crack, and break when used. Any red bark will tan leather. Tanning a rabbit skin will take three weeks, a kangaroo skin six to eight weeks, and a hide three months.

A Deadly Enemy.

Every time you kill a female fly in early spring you have a right to feel that you have routed an army, for it is said that the posterity of one female fly, if unchecked, would amount to seven septillions. (If you want to know how many that is, put down a figure 7 and write 24 zeros after it.)

At that rate we know that there would be no room on the earth for any other animal life. But fortunately there is a high natural death rate among flies and their eggs, and human beings are learning that we must help it along. So kill as many as you can, for a fly is of no benefit to anyone. They carry all sorts of disease and unmentionable filth on their feet; invisible, of course, but very much alive, just the same.

Farms are about the hardest place in which to deal with flies as they necessarily furnish daily the fly's favourite breeding places. The first thing in eliminating flies is to clean up thoroughly manure piles and keep them cleaned just as far as possible either by screening, by distributing on fields, or by treating with some chemical.

There are all sorts of fly traps, poisons, and papers. These help a lot. When you have done all the killing possible then screen everything you can against them.

Flies have killed more people than all the beasts and reptiles put together, simply because they don't appear to hurt us and we are not afraid of them. They are vovles in sheep's clothing, for they carry anthrax, typhoid, dysentery, and a host of other malignant things. In fact, they have been proven to be carriers of at least thirty different diseases and parasitic organisms, such as worms. They do not do a whit of good to anyone, so let's organise and fight them.—“The Queenslander.”

Tick Eradication—State and Commonwealth Co-operation.

The Minister for Agriculture and Stock (Hon. W. N. Gillies) stated, in the course of a recent Press interview, that in July last he received a letter from the Minister for Agriculture in New South Wales, relative to co-operation between this State, New South Wales, and the Commonwealth Government for the eradication of the tick pest, in which he suggested a meeting between representatives of the several Governments. To the proposal in principle Mr. Gillies readily agreed, and when in Sydney later he discussed the matter with Mr. Chaffey and agreed to a meeting, which was held in Brisbane on the 16th of September. The representatives at the meeting were Sir George Knibbs (Institute of Science and Industry) representing the Commonwealth, Mr. E. G. E. Scriven (Under Secretary, Department of Agriculture and Stock), Major A. H. Cory (Chief Inspector of Stock), and Mr. W. D. C. McNeill (District Stock Inspector, Toowoomba), representing Queensland; Messrs. G. Valder (Under Secretary, Department of Agriculture, Sydney), C. J. Sanderson, and Max Henry, representing New South Wales. The meeting suggested that there should be co-operation between the New South Wales, Queensland, and Commonwealth Governments for a period of six years, the first three years to be devoted to work entirely in New South Wales. The contributions proposed during that time are that if New South Wales spends £91,000, the Commonwealth shall contribute £58,000. As no special work can be commenced in Queensland until New South Wales is cleansed of ticks, the undertaking for Queensland is that it shall continue the eradication of ticks within its own borders. For the second period of three years, assuming that New South Wales is clean of ticks, New South Wales agrees to contribute not less than the sum spent by Queensland, but not exceeding £25,000, and the Commonwealth contribution shall not exceed £58,000 a year.

A Board is to be established of representatives of the co-operators to lay down the broad lines upon which the work shall be carried out, but it is clearly understood that the administration shall lie with the States and there will be no interference in the methods pursued by each State in this work. The Queensland Government has approved of the proposed scheme and the New South Wales Government has done likewise, and it now only remains for the Commonwealth Government to signify its intention of co-operating.

Grade Standards for Tomatoes.

Grade standards for Queensland-grown tomatoes have been fixed as follow:—

- “A”—Sound, clean, well-formed, mature fruit, free from cat-face and other blemish, and not sunburnt.
- “B”—Sound, clean, mature fruit, containing not more than 25 per cent. of blemished fruit and not sunburnt.
- “C”—Sound, clean, mature fruit, containing more than 25 per cent. of fruit affected with cat-face or other blemish and not sunburnt.

Special sizing grades have been provided for the Stanthorpe district, *i.e.*, within a radius of 25 miles of the Stanthorpe Post Office. In Stanthorpe, therefore, tomatoes must be sized into the following six sizes:—

“Small”—Tomatoes under 2 inches.

2 inches—Tomatoes of 2 inches or more diameter, but less than 2½ inches.

2½ inches—Tomatoes of 2½ inches or more diameter, but less than 2¾ inches.

2¾ inches—Tomatoes of 2¾ inches or more diameter, but less than 3 inches.

“Large”—3 inches and over in diameter.

“Blemishes” are defined as follows:—

1. A ring crack which is more than skin deep or extends more than 15 per cent. down surface of the tomato from the stem.
2. A radial crack which is more than skin deep or extends more than ½ inch from the stem.
3. Punctures from insects or other causes which are more than skin deep or affect more than 5 per cent. of the surface of the fruit.
4. “Cat-face” covering more than 10 per cent. of the surface of the fruit, or not having an unbroken surface, except in the case of tomatoes under 2½ inches, in which case “cat-face” in any extent is a blemish.
5. Skin marks other than disease blemishes covering more than 10 per cent. of the surface of the fruit.
6. Sunburn.

A Point in Tuberculosis Eradication.

The marketing of pigs with a "tattoo" instrument which has been devised in the United States Department of Agriculture, for use in tuberculosis eradication investigations, has in some instances incriminated the "old hen" on the farm as one of the accomplices in the spread of the infection to swine. The tattoo marks placed on the pigs shipped from an area where tuberculosis is prevalent among cattle and poultry maintains the identity of the pigs even after they have gone through the scalding and scraping process in the packing plant, and makes it possible to trace any infection to its source.

According to Dr. T. S. Rich, inspector in charge of tuberculosis work in Michigan, U.S.A., fowl tuberculosis, if sufficiently prevalent, may cause serious infection among pigs. In a campaign designed to eradicate the disease among cattle, infected pigs were found to be coming from farms on which no cattle were kept, or on which the herds had been free for some years. Continuing their veterinary detective work, the investigators applied the tuberculin test to fifteen lots of chickens, containing seventy-five head. Twelve of the fifteen lots contained reactors. Tests were also applied to the pigs on the farms, with the result that 17 per cent. of swine infection was indicated. In the absence of bovine tuberculosis on the farms where the pigs originated, the tests incriminated tuberculous fowls as the probable source of infection.

Tuberculosis in fowls occurs chiefly among the older birds, especially those more than two years old. The most conspicuous symptom is a rapid loss in weight, especially the emaciation of breast muscles. The investigations quoted indicate that dead fowls should never be fed to pigs, but should be burned or buried.

Australian Produce at Wembley.

Mr. H. W. Mobsby, Queensland Officer, Australian Pavilion, British Empire Exhibition, Wembley, England, and also of this Department, writes, under date 27th August:—

The attendance at Wembley to date has reached the great aggregate of 11,572,997 people. For the past six days the attendance has been 1,287,997. The attendance in our Australian Pavilion has been 6,500,000. This week is "Wales Week" and to-day was very heavy, so you see we are not having any slack time in attending the many inquiries about cotton and sugar. People are asking about the 70,000 tons for export this year, where and to whom will it be sent? I have been asked if it is possible to sell any of the sugar we have exhibited—at the close. All say how they ask for Australian cane sugar but cannot get it at the stores.

The Home and Colonial Stores have a stall in our Pavilion and sell Australian products, including cheese, butter, canned fruits; but they had no pineapples or other Queensland fruit, so I had a surplus of State cannery pines and jam in the basement which I handed over to them to sell, instead of holding it until the end and letting it go at a sacrifice and without a test of our goods on the market. The result is, out of 600 tins of pines they have sold 425 at 1s. 6d., and out of 144 1-lb. tins of jam they have sold out at 8d., and out of 67 2-lb. tins of jam (pineapple) they have sold 36 at 1s. 5d., and people are constantly asking for the 1-lb. tins of pineapple jam. It is a pity the market here cannot be kept supplied. With regard to the big cheese which was taken by the Home and Colonial Stores, I have been told the weight was, when cut up, 1 ton 5 cwt. 1 qr. 23 lb. At one of their branch stores they sold over 600 lb. in one evening. They tell me that they still have people asking for some more of the "big cheese," the flavour was so good. There is a great demand here for our honey. I have sold two 60-lb. tins to a restaurant in the Strand (Smith's honey). There is a stall in our building selling honey put up by Burnside (Australian honey) and they are having great sales. The same man is selling Australian apples and oranges. On Whitmonday over 2 tons of apples were sold. The dried fruits are very popular, especially the sultanas of the Australian Dried Fruit Association. It has become quite a custom to walk through our building eating sultanas from a 6d. carton, but it all shows how our goods are becoming popular, and it is hoped that the energies of the producers will be compensated with a continuance of the trade created or stimulated by the exhibition. We have had very many inquiries about our timbers.

A Mr. V. B. Trapp is in London selling our timber, and finds that he can get very good prices for planks of our cabinet timbers, and I have referred many to our Forestry Department. Only yesterday I had an inspector from the War Office for timber for tool handles and wagon timber. He was greatly impressed with the story of our forestry resources.

What is a Balanced Ration ?

A balanced ration is one in which the essential constituents are supplied in adequate amount and in correct proportion for the purpose in view; or, in more definite language, a balanced ration is one which supplies an adequate amount of starch equivalent, containing the requisite quantity of digestible protein, and combined with a suitable bulk of food for the purpose in view.

In addition to the primary consideration of adequate supplies of starch equivalent and digestible protein in the construction of balanced rations, many other factors must be taken into account, of which the following are a few of the more important:—

- (1) The stock of home-produced foods on hand.
- (2) Relative costs of foodstuffs.
- (3) Palatability.
- (4) The characteristics of the foodstuffs used as regards the laxative or costive effects; the percentage of fibre; their effect on the colour and flavour of butter and milk; and in some cases their effect on the flavour and texture of the meat.
- (5) Mineral matter.
- (6) Vitamins—in some cases.

In commencing to build up a balanced ration it is necessary to ascertain approximately what quantities of such foods as are on hand can be spared per head per day. If, on calculation, it is found that the allowance of foods is insufficient to supply a ration which complies with the required feeding standards, consideration must then be given to the purchase of suitable supplementary foods.

Keep Clear of Abortion.

If you want to keep clear of abortion, remember the following points, written in the "Farmers' Advocate" by Dr. C. P. McGilvray, Principal of the Ontario Veterinary College:—

1. In purchasing breeding cattle, make careful inquiries to ascertain if the herd from which they are being obtained is free from abortion disease.
2. If doubt exists as to their freedom from this disease, have all newly obtained pregnant females tested, or keep them under observation until they calve.
3. Cows should be placed in maternity stalls to calve.
4. Whenever a cow aborts keep her isolated until she cleans.
5. Thoroughly clean and disinfect the stalls in the stable. The bedding and litter removed from the stalls should be burned, together with the aborted foetus and the afterbirth.
6. Wash the hind parts of all the exposed pregnant cows with an antiseptic solution.
7. Cleanse the genital passage of the aborting animal in all cases of retained afterbirth. Irrigate the womb with a mild, warm antiseptic solution or a saline solution. Make use of uterine antiseptic capsules.
8. Do not allow cows with retained afterbirth to remain in stalls adjacent to other pregnant females.
9. Keep aborting cows segregated from the others so long as they are discharging. Wash their hind parts before allowing them to return to the herd.
10. Allow period of one month to elapse before returning aborting cows to the bull. Wash the bull's sheath after service of aborting cows.
11. Do not allow the bull to serve cows which have a discharge from the vulva. Serve all cows on neutral ground.
12. In affected herds obtain the advice of a qualified veterinarian as to the use of vaccines combined with sanitary measures.
13. In badly affected herds best results are obtained from the use of a live culture vaccine administered to the non-pregnant females two months before breeding.
14. In the case of valuable cows becoming barren, the services of a skilled veterinarian should be obtained for the purpose of treating the womb and ovaries.
15. If calves become affected with white scours, immediately separate the sick ones from the healthy. Consult a veterinarian regarding the use of calf-scours serum in conjunction with sanitary measures.
16. Nutritional deficiencies should be corrected as far as possible by supplying mineral elements in the feed.

Products Pools Acts.

Regulation 2 of the Primary Products Pools Acts has been altered. The object of this alteration is to make the ballot-paper regarding the constitution of a Pool Board clearer for the benefit of voters.

Stunting Heifer Calves.

Our observations through many years, writes "Hoard's Dairyman," have led us to the conclusion that one of the pressing needs of the hour is to disseminate a more general appreciation of the importance of fully developing heifers of the dairy breeds. On every hand we see stunted animals that were sired by purebred dairy-bred bulls, and were fondly expected by the inexperienced breeder to develop into dairy cows such as "he saw at the show." Many of such breeders harbour the erroneous belief that the employment of a purebred, pedigreed bull of a dairy breed is all that is necessary to grade up his dairy stock and get into a fine producing lot of animals. We think this unfortunate belief is largely due to the stressing of the idea of breeding to purebred bulls, without impressing upon beginners that the bull only gives the animal a start and endows it with the possibility of better milk and butter fat producing powers, if it happens to be a bull from bred-for-performance ancestors.

The result of the employment of stunted, scrubby-looking, indifferently-bred pedigreed bulls has been unsatisfactory everywhere, and it would have been a blessing if the bulls of that sorry sort had been castrated and beefed. But that is a phase of the subject that can more readily be mended than the failure to develop heifer calves from really worth-while bulls, and we hope that those who are doing extension work to generalise the use of purebred sires will pay due attention to the feeding and management side of calf-raising. The calf clubs have already done much good in that direction. More good might be done were every buyer of a purebred bull furnished with plain directions for the development of the progeny of the sire. Someone who has the necessary experience and information should get out a little brochure of that sort, and it should be made emphatic, impressive, and convincing, as well as scientific and practical.

Travelling about, we see on far too many farms in fly-time in summer dairy calves in dry, brown pasture, where there is little shade and often no drinking water. Other calves are tethered on the roadside under trees; some are in old orchards, or on the front lawn under a bush; others are in dirty yards or pens where the ventilation is poor and sanitary conditions conducive of disease. No real progress is made in such places towards the possibilities of dairy performance conferred upon the heifer calf by its sire, if that animal were capable of such transmission of desirable qualities. On all farms where old or permanent pastures are used year after year by cattle and other stock, and no provision of newly-seeded, legume rich grazing can be provided for the young cattle, the calves will do far better if kept off grass during the first year of life, and fully developed by the hand-feeding of adequate, well-balanced rations. Lung worms quickly infest young calves on old grass on many farms, and on others stomach worms are contracted there. Such infestation inevitably means lack of perfect development, and often serious losses. The old pastures often sour and lacking in lime elements, also fail to supply frame-building materials for the growing animals, and stunting is partly due to that.

The provision of all of the elements necessary for perfect development of the bony frame and of all of the tissues of the calf must be supplied if dairy heifers are to materialise all of the attributes and excellencies of bred-for-performance animals. Every man who has calves to raise will do well to study carefully, and religiously follow out in practice, the rules laid down by research men like McCollum, Hart, Morrison, Humphrey, Forbes, Fraser, and the other practical and scientific workers who have done and are doing so much to help the average farmer to get into a more profitable class of producing dairy cows.

Points for Young Dairymen.

The milk pails require thorough washing, both inside and out. Scalding and then placing all dairy utensils in the sun is a very good practice.

The prepotency of the sire in fixing and transmitting desirable characteristics is verified in innumerable instances with all classes of live stock.

Immediately after a calf is born the navel should be dressed with an antiseptic dressing, which should be repeated daily for three or four days.

This is the time of year when the calves on grass require some shelter from the sun. If there are no trees, a framework may be built up to afford shade.

Those who have an eye to the future are selecting higher quality and more productive breeding stock.

The extra training of the cattle and horses to lead and stand will show to advantage before the judge at either the large or small exhibition.

If a can holds 100 lb. of water, to fill it with milk would require about 103.2 lb. This is because milk has a greater specific gravity than water.

Do not leave barbed wire lying around. We saw a cow the other day with a teat badly lacerated by a prong of wire. This made milking her almost impossible for a few days.

During the hot weather extra care is necessary to keep the milking machine and cream separator clean and sweet. If either machine is dirty, it is a poor advertisement for the business.

If a bull calf is intended to be kept in the herd for stud purposes he should be "ringed" when quite young. About six months is the best age, and the ring must be replaced by a larger one as the bull grows older.

Some animals are subject to attacks of indigestion. A treatment used is equal parts of sulphate of iron, gentian, ginger, nux vomica, and bicarbonate of soda. Give a heaped tablespoonful three times daily in a pint of water.

In cheesemaking the ripened curd must be broken by hand into pieces about the size of walnuts. If it is not done very carefully a loss of fat will be experienced. Do not squeeze the curd in the hand—just break it with the fingers.

Learn to recognise your poorest cows by means of the weigh scales and the Babcock test. The man who fools away his time feeding cows that do not return the cost of feed should be at some job which does not require brain work. Dairying is not that kind of a job.

Grass is an ideal feed for dairy cattle, and the chief economy of the dairy cow lies in her ability to use roughages economically. At the same time the dairy farmer can often feed some grain on pasture to advantage, even though the grass may not be noticeably short.

There are some cows that will drop off in their milk flow if excited. The way some herds are brought in from the paddock, it is a wonder they give any milk. A good dog is an asset, but a poor one can be very expensive to the dairyman. It does not pay to dog the cows.

The man responsible for the adage "Feed is half the breed" was possessed of true wisdom. Proper feeding is of the very highest importance in any beef or dairy herd. An even distribution of good firm flesh, with a proper modicum of fat, topped by bloom and finish, represents the height of good feeding, and is very far removed from flabbiness and grossness.

Answers to Correspondents.

Giant Couch (*Panicum muticum*) and Rhodes Grass.

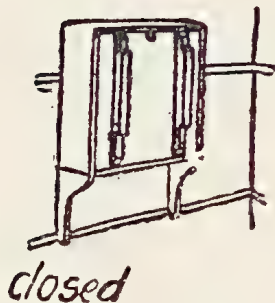
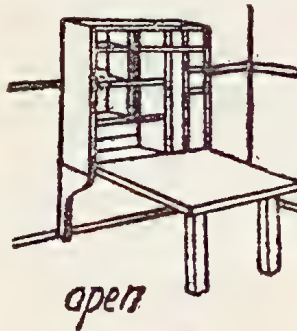
W.R.S. (Mount Larecom)—

Your inquiry concerning a comparison of Giant Couch grass with Rhodes grass was referred to the Agricultural Chemist, Mr. J. C. Brünnich, who states that Giant Couch, like most of the panicums, contains a hydrocyanic acid yielding glucoside, sometimes present in dangerously high amounts, and caution when feeding it, particularly if stock are allowed to graze, must be observed.

The Director of Agriculture, Mr. H. C. Quodling, also advises:—Giant Couch (*Panicum muticum*) is an excellent grass in sub-tropical and tropical localities. Stock find it very palatable during the growing season. The grass is partial to rich scrub soil, but does best in districts where there is a generous rainfall. It thrives well in shallow swamps and low-lying situations which are not inundated for lengthy periods. If "Giant Couch" were a free seeder, it might be fair to compare it with Rhodes grass, were consideration given to the matter of a choice of a grass for recently burnt off scrub land; however, it is never likely to assail Rhodes grass either in popularity or its adaptability for this particular class of country, for the simple reason that "Rhodes" grows and spreads so quickly from seed, whilst the Giant Couch does not seed ordinarily, and must be planted out by hand from cuttings.

FOLDING BENCH AND TOOL-BOX.

Time consumed in carrying tools between locker and bench, when simple jobs are being done, is saved if the tool box is equipped with a combination bench and door, attached by hinges to the bottom. An illustration which appeared recently



in the "Country Gentleman" describes a cabinet of this kind which has much to recommend it. The legs are placed at one end only, as the other end is supported by the box; these will be strong enough if made of 2-in. by 3-in. timber and fastened by small hinges to two braces, or cleats, which run the length of the bench. When the box is closed, the legs fold up against it and take up very little room.

Farm and Garden Notes for December.

Although November is regarded generally as the best period for planting the main maize crop, on account of the tasselling period harmonising later on with the summer rains, December planting may be carried out in districts where early frosts are not prevalent, provided a known quick maturing variety of maize is sown.

To ensure a supply of late autumn and winter feed, dairymen are advised to make successive sowings of maize and sorghums, to be ultimately used either as green feed or in the form of silage. The necessity for such provision cannot be too strongly urged. Farmers who have not had any experience in building an ensilage stack can rest assured that, if they produce a crop for this purpose, information and instruction on the matter will be given on application to the Under Secretary for Agriculture and Stock; also that, whenever possible, the services of an instructor will be made available for carrying out a demonstration in ensilage-making for the benefit of the farmer concerned and his immediate neighbours.

In districts and localities where supplies of lucerne are not available, sowings of cowpeas should be made, particularly by dairymen, as the lack of protein-yielding foods for milch cows is a common cause of diminished milk supplies and of unthriftiness of animals in dairy herds. Cowpeas and lucerne can be depended upon to supply the deficiency. The former crop is hardy and drought-resistant. When plants are to be used as fodder, it is customary to commence to feed them to stock when the pods have formed. Animals are not fond of cowpeas in a fresh, green state, consequently the plants should be cut a day or two before use. Economy is effected by chaffing beforehand, but the plants can also be fed whole. Chaffed in the manner indicated, and fed in conjunction with green maize, or sorghum, when in head, in the proportion of one-third of the former to two-thirds of the latter, a well balanced ration is obtainable. Animals with access to grass land will consume from 40 to 50 lb. per head per day; a good increase in the milk flow is promoted by this succulent diet. The plant has other excellent attributes as a soil renovator. Pig-raisers will find it invaluable also.

A great variety of quick-growing catch crops, suitable for green fodder and ensilage purposes, may also be sown this month, notably Sudan grass, white panicum, giant panicum (liberty millet), Japanese millet, red and white French millet. Well prepared land, however, is required for crops of this description, which make their growth within a very limited period of time. French millet is particularly valuable as a birdseed crop, the white variety being more in favour for this purpose.

Successive sowings may be made of pumpkins, melons, and plants of this description.

In districts where onions are grown, these will now be ready for harvesting. If attention is given, in the case of garden plots, to bending over the tops of the onions, maturity of the crop is hastened. Evidence will be shown of the natural ripening-off process, and steps should be taken to lift the bulbs and to place them in windrows until the tops are dry enough to twist off. If a ready market is not available, and it is decided to hold over the onions for a time, special care should be taken in handling. Storage in racks in a cool barn is necessary, otherwise considerable deterioration is to be expected. Improved prices are to be looked for in marketing by grading and classifying produce of this description.

Cotton areas which were subjected to a thorough initial preparation, thereby conserving a sufficiency of moisture for the young plants, should now be making good headway and sending their taproots well down. Keep down all weed growth by scarifying as long as the growth will admit of horse work.

KITCHEN GARDEN.—Gather cucumbers, melons, vegetable marrows, and French beans as soon as they are fit for use. Even if they are not required, still they should be gathered, otherwise the plants will leave off bearing. Seeds of all these may be sown for a succession. Tomatoes should be in full bearing, and the plants should be securely trained on trellises or stakes. Where there is an unlimited supply of water, and where shade can be provided, lettuce and other salad plants may still be sown. All vacant ground should be well manured and dug two spits deep. Manure and dig as the crops come off, and the land will be ready for use after the first shower.

FLOWER GARDEN.—Keep the surface of the land well stirred. Do not always stir to the same depth, otherwise you are liable to form a "hard pan," or caked layer beneath the loose soil. Alternate light with deep hoeings. A few annuals may still

be planted, such as balsams, calendulas, cosmos, coreopsis, marigold, nasturtium, portulacca, zinnia, and cockscomb. Plant out whatever amaranthus may be ready. These may still be sown in boxes. Clear away all annuals which have done flowering. Bulbs should have all the dead leaves cut away, but the green leaves should not be touched. Stake chrysanthemums, and, as the flower buds develop, give them weak liquid manure. Coleus may now be planted and propagated from cuttings. Dahlias are in various stages, but the greater part will have been planted by this time. Give them liquid manure, and never let them dry up. Lift narcissus about the end of the year, but do not store them. Plant them out at once in their new positions. Top-dress all lawns.

Orchard Notes for December.

THE COASTAL DISTRICTS.

The planting of pineapples and bananas may be continued, taking care that the ground is properly prepared and suckers carefully selected, as advised previously in these Notes. Keep the plantations well worked and free from weed of all kinds, specially if the season is dry. New plantations require constant attention, in order to give young plants every chance to get a good start; if checked when young they take a long time to pull up and the fruiting period is considerably retarded. Small areas well worked are more profitable than large areas indifferently looked after, as the fruit they produce is of very much better quality. This is a very important matter in the case of both of these fruits, as with the great increase in the area under crop there is not likely to be a profitable market for inferior fruit. Cannerymen only want first-class pines of a size that will fill a can, and cannot utilise small or inferior fruit, except in very limited quantities, and even then at a very low price. Small, badly filled bananas are always hard to quit, and with a well-supplied market they become unsaleable. Pineapple-growers, especially those who have a quantity of the Ripley Queen variety, are warned that the sending of very immature fruit to the Southern markets is most unwise, as there is no surer way of spoiling the market for the main crop. Immature pineapples are not fit for human consumption, and should be condemned by the health authorities of the States to which they are sent.

Citrus orchards require constant attention; the land must be kept well worked and all weed growth destroyed. Spraying or cyaniding for scale insects should be carried out where necessary. Spraying with fungicides should be done where the trees show the need of it. A close lookout must be kept for the first indications of "maori," and as soon as it is discovered the trees should either be dusted with dry sulphur or sprayed with the lime-sulphur, potassium, or sodium sulphide washes. Borer should be looked for and destroyed whenever seen.

Early grapes will be ready for cutting. Handle carefully, and get them on to the market in the best possible condition. A bunch with the bloom on and every berry perfect will always look and sell well, even on a full market, when crushed and ill-packed lines are hard to quit.

Peaches, plums, papaws, and melons will be in season during the month. See that they are properly handled. Look out for fruit fly in all early ripening stone fruit, and see that none is left to lie under the trees to rot and thus breed a big crop of flies to destroy the mango crop when it ripens.

Keep leaf-eating insects of all kinds in check by spraying the plants on which they feed with arsenate of lead.

Look out for Irish blight in potatoes and tomatoes, and mildew on melons and kindred plants. Use Bordeaux or Burgundy mixture for the former, and finely ground sulphur or a sulphide spray for the latter.

GRANITE BELT, SOUTHERN AND CENTRAL TABLELANDS.

Early ripening apples, plums, apricots, peaches, and nectarines will be ready for marketing during the month. They are unsatisfactory lines to handle, as the old saw, "Early ripe, early rotten," applies to all of them; in fact, the season of any particular variety is so short that it must be marketed and consumed as quickly as possible. All early ripening deciduous fruits are poor carriers and bad keepers, as their flesh is soft and watery, deficient in firmness and sugar, and cannot, therefore, be sent to any distant market. The available markets are quickly over-supplied with this class of fruit, and a glut takes place in consequence. Merchants frequently make the serious mistake of trying to hold such fruits, in the hope of the market improving, with the result that, instead of improving, the market frequently becomes more and more congested, and held-over lines have to be sent to the tip. There is only one way to deal with this class of fruit, and that is to clear the markets daily, no matter what the price, and get it distributed and into consumption as rapidly as possible by means of barrowmen and hawkers. Most early ripening fruits are useless for preserving in any way, their only value being what they will bring for consumption whilst fresh. This being so, it is only a waste of time and money to forward immature, undersized, and inferior fruit to market, as it is not wanted, and there is no sale for it. It should never have been grown, as it is frequently only an expense to the producer, besides which, unless the fallen or over-ripe fruit is regularly and systematically gathered and destroyed in the orchard, it becomes a breeding ground for fruit fly and codlin moth, as well as of fungi, such as those producing the brown and ripe rots. Early ripening fruits should, therefore, be carefully graded for size and quality, handled, and packed with great care, and nothing but choice fruit sent to market. If this is done, a good price will be secured, but if the whole crop—good, bad, and indifferent—is rushed on to the local markets, a serious congestion is bound to take place and large quantities will go to waste.

Orchards and vineyards must be kept in a state of perfect tilth, especially if the weather is dry, so as to retain the moisture necessary for the development of the later ripening fruits. Where citrus fruits are grown, an irrigation should be given during the month if water is available for this purpose, excepting, of course, there is a good fall of rain sufficient to provide an ample supply of moisture.

Codlin moth and fruit fly must receive constant attention and be kept under control, otherwise the later-ripening fruits are likely to suffer severely from the depredations of these serious pests.

Grape vines must be carefully attended to and sprayed where necessary for black spot or downy mildew, or sulphured for oidium. Where brown rot makes its appearance, spraying with the potassium or sodium sulphide washes should be carried out. Leaf-eating insects of all kinds can be kept in check by spraying with arsenate of lead.

Vegetables will require constant attention in the Granite Belt area. Tomatoes and potatoes will require to be carefully watched in order to prevent loss from Irish blight, and no time should be lost in spraying these crops should this disease make its appearance in any part of the district, as it can be prevented by spraying with either Bordeaux or Burgundy mixture. These fungicides effectually protect the plants to which they are applied if used in time. If leaf-eating insects, such as beetles, grasshoppers, and caterpillars, are doing damage as well, add 3 or 4 lb. of arsenate of lead to the 100 gallons of spraying mixture used for the prevention of early and late blight (potato macrosporium and Irish blight), so that the one application will be effectual for both classes of diseases.

Keep all kinds of vegetables well worked, stirring the land frequently to retain moisture, and taking care to prevent the formation of a surface crust should rain fall. Remember that vegetables require plenty of moisture; therefore leave nothing to chance, but do your best to retain all the moisture in the soil you possibly can.

GOVERNMENT AGRICULTURAL LABORATORY.

INSTRUCTIONS FOR THE COLLECTION OF SAMPLES, AND SCALE OF FEES.

GENERAL INSTRUCTIONS.

1. All analyses will be carried out in the order in which the samples are received at the Laboratory, with the exception of perishable substances, which will be analysed immediately after arrival.

2. Should any person wish for an immediate analysis, the fee, charged in accordance with the scale of fees below, will be increased by 50 per cent.

3. The samples may be forwarded by parcel post or by rail, carriage paid, to the

Under Secretary for Agriculture and Stock, Brisbane.

In all cases a letter, giving full instructions as to the information required, and enclosing the prescribed fee, must be sent at the same time.

4. Analyses will only be carried out if these instructions are adhered to, and if the samples are taken in accordance with further instructions issued below.

5. The Under Secretary may, under special circumstances, modify the fees charged for analytical work.

SCALE OF FEES FOR ANALYSES.

	Public.			Farmers, &c.*		
	£	s.	d.	£	s.	d.
Butter, cheese, margarin, commercial analysis	3	3	0	0	10	6
Butter, cheese, margarin—determination only of boric acid, sulphites, salt, ash, &c., each	0	10	6	0	2	6
Condensed milk, milk powders, commercial analysis ..	3	3	0	0	10	6
Cream and milk—Fat only, by Babcock test	0	5	0	0	2	6
Cream and milk—Fat only, by Gottlieb Rose test ..	1	1	0			
Cream and milk—Commercial analysis	2	2	0	0	5	0
Cream and milk—Test for preservatives, each	0	10	6	0	2	6
Dip concentrates, arsenical dips—Commercial analysis ..	2	2	0			
Dip concentrates, phenolic dips—Commercial analysis ..	2	2	0			
Dip concentrates, mixed arsenical and phenolic dips..	3	3	0			
Dipping fluids, weed destroyers—Arsenic only	1	1	0	free†		
Fertilisers—Determination only of—						
Fat, lime, nitrogen, nitrate nitrogen, ammonia nitrogen, phosphoric acid water soluble, citrate (soluble and total), potash, each	1	1	0	0	3	0
Degree of fineness	0	10	6	0	3	0
Commercial analysis, including fineness but not fat—						
Blood manure, dried blood	1	11	6	0	3	0
Bone meal, bone dust	2	2	0	0	6	0
Meatworks fertiliser, bone and blood mixtures ..	2	2	0	0	6	0
Mixed fertilisers, guano, complete	4	4	0	0	10	6
Rock phosphates	2	10	0	0	10	6
Superphosphates	2	2	0	0	6	0
Thomas phosphate, basic slag	2	2	0	0	6	0
Charge for sampling (excluding travelling expenses)	1	1	0			
Foodstuffs, grains, meals, oil cakes—Estimation of—						
Moisture	0	12	6	0	2	6
Crude ash	0	12	6	0	2	6
Crude fibre, crude oil or fat, crude protein, digestible protein, each	1	1	0	0	2	6
Complete commercial analysis	3	3	0	0	10	6

* Reduced fees apply only to such residents in Queensland whose main source of income is from agricultural, pastoral, and horticultural pursuits.

† Dipping fluids are analysed free of charge for the owners of all registered dips.

SCALE OF FEES FOR ANALYSES— <i>continued.</i>						Public.	Farmers, &c.*
						£ s. d.	£ s. d.
Insecticides, fungicides, &c.—See Pest destroyers.							
Leather—Commercial analysis	..	..	..	..	..	3 3 0	
Leather—Determination of glucose only	..	..	..	..	..	1 1 0	
Limestones, marls, quick lime	..	..	..	..	..	2 2 0	0 10 6
Meat extract—Commercial analysis	..	..	..	..	..	3 3 0	
Parchment papers, butter packing paper	..	..	..	..	..	2 2 0	
Pest destroyers—							
Arsenic—Commercial analysis	..	..	..	..	..	2 2 0	0 10 6
Arsenic—Determination of arsenic only	..	..	..	..	..	1 1 0	free
Arsenate of lead, arsenate of lime	..	..	..	..	..	2 2 0	0 10 6
Bordeaux mixture	..	..	..	..	..	1 10 0	0 10 6
Copper acetate, copper sulphate	..	..	..	..	..	1 1 0	0 10 6
Cyanide of potassium or sodium	..	..	..	..	..	1 1 0	0 10 6
Formalin	..	..	..	..	..	1 1 0	0 10 6
Iron sulphate	..	..	..	..	..	1 1 0	0 10 6
Lime-sulphur	..	..	..	..	..	2 2 0	0 10 6
Nicotine and nicotine compounds	..	..	..	..	..	1 11 6	0 10 6
Paris green	..	..	..	..	..	1 10 0	0 10 6
Petroleum or kerosene emulsion, red oil	..	..	..	..	..	1 1 0	0 10 6
Phenolic disinfectants, lysols, &c.	..	..	..	..	..	2 2 0	0 10 6
Sulphur, flowers of sulphur	..	..	..	..	..	2 2 0	0 10 6
Phosphorous pastes	..	..	..	..	..	1 1 0	0 10 6
Tobacco dust, tobacco preparations	..	..	..	..	..	1 11 6	0 10 6
Preservatives	..	..	..	..	..	2 2 0	0 10 6
Salt—Complete analysis	..	..	..	..	..	2 2 0	
Soap—Commercial analysis	..	..	..	..	..	3 3 0	
Soils—Estimation of—							
Lime, nitrogen, potash, phosphoric acid, each	..	..	..	..	..	1 1 0	0 3 0
Partial Analysis	..	..	..	..	..	3 3 0	0 10 6
Mechanical analysis	..	..	..	..	..	2 2 0	
Complete analysis, including citric soluble and mechanical analysis	..	..	..	..	..	5 5 0	
Sugar-cane	..	..	..	..	..	2 2 0	free
Sugars, syrups, molasses	..	..	..	..	..	3 3 0	
Tallow, titre test	..	..	..	..	..	1 10 0	
Tallow, acidity	..	..	..	..	..	0 10 6	
Tanning materials—Estimation of tannins and non-tannins	..	..	..	..	..	2 2 0	
Waters—							
Estimation of total solids and chlorine, each	..	..	..	..	..	0 10 6	
Partial analysis, for stock and irrigation	..	..	..	..	..	1 10 0	0 10 6
Complete analysis	..	..	..	..	..	4 4 0	
Wheat—Milling test	..	..	..	..	..	2 2 0	
Testing of dairy glassware—							
Milk and cream bottles	..	..	..	..	..	0 0 2	each
Milk and cream pipettes	..	..	..	..	..	0 0 3	each
Dairy thermometers	..	..	..	..	..	0 0 6	each
Special thermometers, lactometers, Brix spindles	..	..	..	..	..	0 3 6	each
Unpacking and repacking Babcock bottles	..	..	..	..	..	0 2 0	gross
Testing N/10, alkali and acid	..	..	..	..	..	0 0 6	pint
Preparing standard iodine solution	..	..	..	..	..	0 2 0	pint

INSTRUCTIONS FOR TAKING AND COLLECTING OF SAMPLES.

SOILS.

A rough sketch of the field, paddock, or block of land from which the samples are to be taken should be prepared to accompany the samples. The spots where the samples are taken are marked on this plan, and are numbered. This sketch plan should also indicate position of roads, creeks, gullies, ridges, general fall, and aspect of land, &c.

Should the soil in various parts of the block show a very marked difference, it will be necessary to divide the block into two or more parts. Should the different soil occur only in a small patch, this sample may be left out.

Not less than three samples should be taken in each section. A greater number is to be preferred, as a better average will be obtained. In order to obtain a fair average sample of the soil from a block of land, as nearly as possible equal quantities of soil are collected from various parts of the field.

At the places chosen for the taking of the samples the surface is slightly scraped with a sharp tool, to remove any surface vegetation which has not as yet become part of the soil.

Vertical holes from 10 to 18 in. square are dug in the ground to a depth of 3 ft. The holes are dug out like post-holes; an earth-auger facilitates the operation considerably, and the holes may be trimmed with the spade afterwards, and the holes cleaned out.

Careful note of the appearance of the freshly cut soil of any intermediate layer and of the subsoil should be taken. The depth of the real soil, which in most cases is easily distinguished, is also measured and noted for each hole. Note how deep the roots of the surface vegetation reach into the soil. If the soil changes gradually into the subsoil, as is the case in some places where the soil is of very great depth, this line of division can only be guessed approximately, and it is best to take the soil uniformly to a depth of 12 in.

With a spade a slice of soil, from 3 to 4 in. thick, down to the beginning of the subsoil or to a depth of 12 in., is now cut off and put on to a clean bag. The same is done with the subsoil, and the slice is taken from where the soil ends (or 12 in.) to the bottom of the hole, and this subsoil placed on another bag. Stones over the size of a pea may be picked out, the rough quantity of such stones estimated, and a few enclosed with the samples. Fine roots must not be taken out from the soil samples. The same operation is repeated at the other places chosen. Take careful note and give description of soils in each hole as numbered and marked on plan. The samples of soil collected on the one bag are thoroughly mixed by breaking up any large clods, and about 5 lb. of the mixed soil are put into a clean canvas bag, which is securely tied up and labelled. The same is done with the samples of subsoil collected separately on the other bag.

All the samples collected are afterwards placed in a wooden box.

It is important to use clean bags and clean boxes, and also that the samples should not be left in the neighbourhood of stables or manure heaps.

A short description of the land must accompany the samples and the sketch plan. In the case of cultivated land, state how long the land has been under cultivation, what crops were chiefly grown, results of such crops, was any manure applied, when, and what sort, and in what quantities per acre. In the case of virgin soil, state if the land was heavily timbered or not, ring-barked, if scrub or forest land what sort of timber was chiefly growing on the land. In all cases a description of the neighbouring land, outcropping rocks, &c., is of great value. Also state if the land is naturally or artificially drained or not; describe the land as regards its position to hills, roads, creeks, ridges, &c.

Only by adhering strictly to these instructions, and by giving minute details, can benefit be derived from the soil analyses.

Special forms of application for "*Advice as to Manurial Treatment of Soil*" have been prepared, and may be obtained from the Under Secretary, Department of Agriculture and Stock.

It is strongly advised to fill up one of these forms in each case when a sample of soil is submitted for analysis.

WATER.

It is best to collect and forward samples of water for analysis in stoppered glass bottles, generally known as Winchester quarts.

The bottles have to be perfectly clean, and stoppers must fit well. Corks should be avoided but if used must be new and well washed with the water before being used for closing the bottle.

When taking waters from taps, pumps, bores, the water must be allowed to run for a while before taking the sample. When taking the water out of a well, pond, or river, the bottle is completely immersed, but care must be taken not to disturb the mud or sediment at the bottom of the water. Before the sample is actually collected, the bottle is rinsed three times with the water, filling each time about one-third full. The bottle is then filled within about 1 in. from the top; the stopper is inserted and securely tied down with a clean piece of linen or calico.

The stopper must not be fastened or luted with sealing-wax, paste, plaster of paris, &c.

State for what purpose the water is to be used, as for irrigation, household purposes, factory use, steam boilers, stock, &c.

Forms of application for "*Analysis of Water*" have been prepared, and may be obtained from the Under Secretary, Department of Agriculture and Stock. Suitable bottles for taking samples of water, both for chemical analysis and for bacteriological examination, may also be obtained on application.

FERTILISERS.

When taking samples of artificial manures from bags, the samples must be taken from different bags and at different places of the bag and not only from the top; or the contents are emptied on a heap and mixed up well, and the samples then taken.

The samples sent for analysis should not weigh less than $\frac{1}{2}$ lb., and not more than 2 lb., and should be contained in a clean, dry bottle (lightning jars are very suitable), or stone jar, or in tins with tightly fitting lids. To each sample must be securely attached a label, giving all the particulars required by the regulations in connection with "*The Fertilisers Act of 1914*" and "*The Fertilisers Act Amendment Act of 1916.*"

It is extremely difficult to obtain a fair average sample from a large quantity of a mixed fertiliser. Special precautions have to be taken, and a special sampling tool must be used. Minute instructions to take such samples are being prepared, and the inspectors under the Fertilisers Acts will be instructed in the proper method of procedure.

FOODSTUFFS.

It is always important to obtain good average samples, and this can only be done by carefully taking the samples from different places, mixing well, and taking a portion of the mixture. This method would apply to any dry foodstuffs—as grains of any kind, peas, beans, chaff, pollard, meal, &c. For the analysis of green foods—as green hay, sorghum, silage—it is best to make a mixture of the sample by passing it through a chaffcutter, and by taking an accurately weighed quantity—say, 3 lb. This quantity is then dried in the sun, taking care that nothing is lost, and when dry put in a bag and forwarded for analysis, stating how much of the original green stuff the total amount of the dried material sent represents.

To collect information about value of *green manures*, it is best to plot out exactly 1 square yard in the field covered with the plant, not picking out a position where the growth is very heavy or poor, but about a fair average. Four pegs are driven into the ground at the four corners, and strings stretched between them; with a sharp spade all the plants are cut along the strings, so as to get really the growth of 1 square yard. The plants are all collected and accurately weighed, passed through a chaffcutter, and the sample for analysis taken as above described. In many cases the roots may be also pulled out, weighed separately, and a sample forwarded.

The samples must be accompanied by a description of the crop—when planted, how old when cut, if the land was manured or not, weight of crop per acre or per square yard, and weight of the sample forwarded when in its green state. In the case of green manures it is generally best to take the samples just after flowering, and immediately before ploughing in.

Wheat.—Samples of wheat sent to be tested for their milling qualities, and analysis of flours obtained therefrom, should not weigh less than 2 lb. each, and should be well cleaned and free from weevils. Give full particulars about the locality in which the wheats were grown, and also the weight of the crop in bushels per acre.

Milk and Cream are best preserved for analysis by adding to every 8 oz. of liquid about 5 grains of powdered bichromate of potash, and mixing the sample with the preservative by shaking the bottle.

Should it be desired to have a sample of milk or cream tested for preservatives, a second sample should be sent in its natural state.

The sample bottles should be closed with a well-fitting cork, and placed with the cork downwards in the boxes so that the cream will not collect on the cork but on the bottom of the bottle.

DIPPING FLUIDS.

Special forms for taking and forwarding dipping fluids for analysis may be obtained on application.

ASTRONOMICAL DATA FOR QUEENSLAND.

TIMES COMPUTED BY D. EGLINTON, F.R.A.S.

TIMES OF SUNRISE AND SUNSET.
 AT WARWICK.

1924.	OCTOBER.		NOVEMBER.		DECEMBER.	
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.
1	5 33	5 50	5 3	6 9	4 51	6 32
2	5 32	5 51	5 2	6 10	4 51	6 33
3	5 31	5 51	5 1	6 11	4 50	6 34
4	5 30	5 52	5 0	6 12	4 50	6 35
5	5 29	5 52	5 0	6 13	4 50	6 36
6	5 28	5 53	4 59	6 13	4 50	6 36
7	5 27	5 53	4 59	6 14	4 50	6 37
8	5 25	5 54	4 58	6 14	4 51	6 37
9	5 24	5 54	4 57	6 15	4 51	6 38
10	5 23	5 55	4 57	6 16	4 51	6 39
11	5 22	5 55	4 56	6 17	4 52	6 39
12	5 21	5 56	4 56	6 18	4 52	6 40
13	5 20	5 56	4 55	6 18	4 52	6 40
14	5 19	5 57	4 55	6 19	4 53	6 41
15	5 17	5 58	4 54	6 20	4 53	6 41
16	5 16	5 58	4 54	6 20	4 53	6 42
17	5 15	5 59	4 53	6 21	4 54	6 42
18	5 14	6 0	4 53	6 22	4 54	6 43
19	5 13	6 1	4 52	6 23	4 55	6 43
20	5 12	6 1	4 52	6 24	4 55	6 44
21	5 11	6 2	4 52	6 25	4 56	6 45
22	5 10	6 3	4 52	6 25	4 56	6 45
23	5 9	6 3	4 52	6 25	4 57	6 46
24	5 9	6 4	4 51	6 27	4 57	6 46
25	5 8	6 4	4 51	6 28	4 58	6 47
26	5 7	6 5	4 51	6 28	4 58	6 47
27	5 7	6 5	4 51	6 29	4 59	6 48
28	5 6	6 6	4 51	6 30	5 0	6 48
29	5 6	6 7	4 51	6 31	5 0	6 49
30	5 5	6 7	4 51	6 31	5 1	6 49
31	5 4	6 8	...	...	5 1	6 49

Phases of the Moon, Occultations, &c.

The times stated are for Queensland, New South Wales, Victoria, and Tasmania.

6 Oct. (First Quarter 12 30 a.m.
 13 " ○ Full Moon 6 21 a.m.
 21 ") Last Quarter 8 54 a.m.
 28 " ● New Moon 4 57 p.m.
 Perigee, 2rd and 30th October { 3 6 p.m.
 { 12 12 a.m.

Apogee, 18th October . . . 6 18 p.m.
 On the 10th October, at 8:17 p.m., Uranus will be in conjunction with the moon about three times the moon's diameter below it. This should be observable in binoculars.

On 27rd October, at about 10 p.m., Regulus will be occulted by the moon at Thursday Island, but not at Cooktown or Cairns, where Regulus will appear just above the edge of the moon; further south the distance between Regulus and the moon will appear greater.

On the 26th October, at 1:0 p.m., Mercury will be in superior conjunction with the sun—that is, on the far side of its orbit beyond the sun, where it will be quite invisible. Venus will be a morning star, and Saturn, Jupiter, and Mars will be visible in the evenings during this month.

4 Nov. (First Quarter 8 18 a.m.
 11 " ○ Full Moon 10 0 p.m.
 20 ") Last Quarter 3 38 a.m.
 27 " ● New Moon 3 15 a.m.

Apogee, 15th November, 11:0 a.m.
 Perigee, 27th November, 10:36 a.m.

Venus, still the most brilliant morning star, will be about five degrees west of Spica (the principal star of Vergo) on the 15th; Mars on that date will be apparently amongst the smaller stars of Aquarius, setting about half-past 1 in the morning. Jupiter will be apparently amongst the stars of Scorpio about 15 degrees to the north-east of Antares, Saturn will be visible only in the east, rising about an hour before the sun.

3 Dec. (First Quarter 7 10 p.m.
 11 " ○ Full Moon 5 3 p.m.
 19 ") Last Quarter 8 11 p.m.
 26 " ● New Moon 1 45 p.m.

Apogee, 12th December, 6:36 p.m.
 Perigee, 26th December, 11:12 a.m.

Mercury will be at its greatest elongation east of the sun on the 10th, and will rise and set one hour and twenty-four minutes after the sun on the 15th, apparently amongst the stars of Sagittarius. Venus will still be the brilliant morning star, rising about 2 a.m. on the 15th, apparently among the stars of Libra; Mars, having apparently reached the constellation Pisces, will set soon after midnight on the 15th. Jupiter will not be so well situated for observation, and will be lost in the sun's rays towards the end of the month. Saturn, as a morning star, will rise about half an hour before Venus in the middle of this month.

For places west of Warwick and nearly in the same latitude, 28 degrees 12 minutes S., add 4 minutes for each degree of longitude. For example, at Inglewood, add 4 minutes to the times given above for Warwick; at Goondiwindi, add 8 minutes; at St. George, 14 minutes; at Cunnamulla, 25 minutes; at Thargomindah, 33 minutes; and at Oontoo, 42 minutes.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night; when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

.. It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

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QUEENSLAND AGRICULTURAL JOURNAL

VOL. XXII.

DECEMBER, 1924.

PART 6.

Event and Comment.

The Current Issue.

Readers will find the December Journal a very informative number. Interesting results of crop experiments and fertiliser trials in the Central and Northern districts are supplied, respectively, by Mr. C. S. Clydesdale and Mr. N. A. R. Pollock. The progress of the Departmental Wool Branch and its successful operation of a scheme for handling small farmers' clips are described interestingly by Mr. W. G. Brown. Cultural notes on the Sweet Potato are contributed by the Agricultural Branch; also a note on the Poultry Tick by Mr. Rumball. A notable contribution is an account of profitable banana-growing at Kin Kin, on the North Coast, from the pen of Mr. C. N. Freeman, who has achieved much success in the industry. Mr. C. T. White discusses a poisonous plant common in our coastal rain forests, and known as the Native Bryony. This month Mr. Shelton's main topic is the merits of some root crops as food for pigs. Reprinted matter includes some valuable notes on the food value of dried whey solids, and a paper on rural hygiene. The activities of the Bureau of Sugar Experiment Stations are well covered, and a report on Fruit Fly Investigations helps to sustain interest in Mr. Hubert Jarvis's notable work on the Granite Belt.

Our Northern Climate.

"There is evidence that the old bogey regarding the unsuitability of North Queensland as a place for white people to live in is still being used on the other side of the world," said the Acting Premier (Hon. W. N. Gillies) in the course of a recent Press interview. Some immigrants of a quota that arrived in Brisbane recently expressed their disappointment when they found that their destination was to be North Queensland. Several of these settlers have since written to friends expressing their surprise and approval of the Northern climate. "My attention having been called to certain adverse reports respecting the conditions alleged to obtain in North Queensland, I have cabled to the Agent-General asking him to take action to combat and controvert them, and to call special attention to the more striking passages in a report by the Director of the Australian Institute of Tropical Medicine at Townsville (Dr. R. W. Cilento), which disproves these allegations." Mr. Gillies went on to say that Dr. Cilento's report concerning the climatic conditions of North Queensland, as they affected the health and virility of the people, was a valuable one, and 40,000

copies of it were printed by the Government; a large number was circulated at the British Empire Exhibition at Wembley Park, and many were distributed through the Agent-General's office. It is only necessary to study the conclusions of this eminent authority and to note the low death-rate and infantile mortality figures, as compared with those of any other country in the world, to realise how ridiculous is the assumption that North Queensland is not a fit place of residence for white people. Dr. Cilento points out that, in respect to the influence of climate on the health of residents in the tropics of Australia, a careful scientific inquiry had failed to elicit any facts showing evil climatic effects on public health. He adds that the majority of those violently opposed to the colonisation of the North are either people who have never been there, or those whose conservatism makes it impossible for them to form an unbiassed opinion. All scientific inquiry goes to prove that there is no obstacle to the white race working, living, thriving, and multiplying in the Australian tropics. Mr. Gillies's recent tour through the North during one of the hottest months in the year confirmed him in his belief that North Queensland is not only suitable in every way for the homes of white people, but will ultimately carry a white population at least equal to the present population of the Commonwealth.

The Cotton Crop.

The excellent effect which proper spacing and good cultivating has on the development of the fruiting system of cotton plants in comparison with the considerably lesser development of plants not so well served was strikingly evident in the course of a recent tour of inspection through the Central Queensland cotton areas by the Departmental Cotton Specialist, Mr. W. G. Wells. In general, the condition of the planted crops throughout the areas visited was good. Many were in excellent condition and at least a month ahead in development of plants at the corresponding period of last season. Some crops were observed where the thinning and cultivating had not been done in time, and thus the growth of the plants had been retarded. Such instances occurred often where the areas were 20 acres or more in extent, and it is believed that if the growers who are also dairying would confine themselves to acreages which they are able to handle efficiently, there would be a marked improvement in the standard of cotton growing. This is shown by the results being obtained this season by the Durango growers, most of whom have restricted their areas to acreages they could properly care for.

In nearly every district a large number of crops was seen which had been thinned out at the proper time and well cultivated. The plants in such fields were well loaded with squares, and in the more advanced crops the flowering was becoming general over the whole of the field. The effect of proper spacing and cultivating on the development of the fruiting system of a plant was clearly shown when plants in such fields were compared with plants in fields in which the cultivation had been poor and the thinning either delayed for a considerable time or not done. The properly grown plants were producing fruiting branches on the fifth or sixth joint above the seed leaves, which were well laden with squares (flower buds) and in many cases young bolls as well, whereas the plants which had been improperly grown were only just commencing to produce a few small fruiting branches near the tops of the plant. The early development of the crop of squares and bolls is believed to be of the utmost value. Even if some of the lower bolls are lost by excessive moisture caused by a wet season in January or February, it is expected that the early setting of the crop will cause the plant to toughen-up during the hot spell prevailing in most parts of the cotton belt to such an extent that the plant will not so quickly respond to any heavy rains falling later on as to produce such a rank growth, and a severe loss of crop, as was experienced over many parts of the cotton areas of last season.

A Ratoon Problem.

One very noticeable feature observed by Mr. Wells in nearly every cotton area where ratoon cotton was being grown on old cultivated land, was the difficulty that the growers were having in keeping the ratoon crops sufficiently free from grass and weeds to allow of the proper amount of cultivation. Especially was this so in cases where crops of over 20 acres were being grown by one individual. Owing to the branches of the ratooned bushes spreading away from the plant in a nearly horizontal position, they were covering such a wide area that it was impossible to cultivate with a machine without inflicting serious damage. The heavy crop of summer grass and pig weed which had developed following the period of rainy weather some weeks back therefore had to be chipped out by hand. Many fields of the ratoon crop appeared to have been either abandoned, or had been reduced to an area which the grower could cope with. Where the chipping and cultivating had been delayed the plants were showing distinct signs of suffering from lack of moisture—the leaves wilting badly in the forenoon and the bolls commencing to show evidence of being stunted in their development.

Bureau of Sugar Experiment Stations.

CANE PEST COMBAT AND CONTROL.

ENTOMOLOGIST'S REPORT.

The Director of the Bureau of Sugar Experiment Stations (Mr. H. T. Easterby) has received the following reports from the Entomologist at Meringa, near Cairns (Mr. E. Jarvis):—

Results of Past Experimentation.

Reviewing the cane-grub situation by the light of comprehensive data obtained during research work continued for the last ten years, we are now in a position to state that, in the opinion of the writer, our chief offender, the well-known grey-back cockchafer is best controlled during its larval and imago stages of development.

As a result of careful consideration of numerous methods of combating the various life-cycle phases of this pest, I may say that those applicable to the grub condition have proved the most promising up to the present.

Such control methods can, if desired, be practised during a period of from two to three months, while the larvæ are passing through their first and second instars, before they have been able to damage the cane; moreover, the grower has the satisfaction of knowing that destruction of the grubs attacking any particular crop in December and January (after disappearance of the beetles) means that any cane so treated is certain to yield maximum results, since no further infestation of grubs can possibly occur until the following year.

Commenting on the various remedial measures outlined in a previous monthly report for March, 1915 ("Australian Sugar Journal, Vol. VII., pp. 140-41), it may be stated that while one or two of these still offer a wide field for future research, the following stand out as being well within reach of our canegrowers.

- (3) Collecting grubs by hand wherever practicable, both from behind the plough and from under trash in wet weather.
- (4) Fumigation of the soil with a gas deadly to animal life, but having, if possible, a stimulating effect on vegetation.
- (8) Encouraging vigorous root development and conditions favourable to conservation of moisture by judicious manuring and thorough cultivation.
- (10) Maintaining the soil in a friable state, and free from weeds throughout the growing season.

It is encouraging to be able to announce that investigations carried out during the last couple of years regarding the possibilities of measure No. 4 have yielded positive results, both in laboratory and field experimentation, and might now be said to have arrived at a focus, as it were; fumigation of the grubs during the first and second instars having been accorded chief place.

Carbon bisulphide has been used for many years in our Northern canefields, and when applied intelligently and at the right time good results appear to have followed. Its use, however, instead of becoming more general has decreased of late, owing to various causes which need not be discussed here. In some other sugar-growing countries, Porto Rico for example, where it was used in 1918 for combating grubs of *Phyllophaga* and *Phytalus*, it proved disappointing, and when doses exceeding 12.5 c.c. were employed was found to injure the cane, "stunting its growth, and often killing the plant."

Up to the present our experiments with soil fumigants have shown that paradichlor. is entitled to take first place as a controlling agent against the grubs of our principal cane-beetle.

Calcium cyanide is likely to prove equally effective, laboratory tests on grubs in cages having given startling results. No field trials have yet been made, however, although it is hoped to establish experiment plots in this connection during the coming season.

Natural Control Checking Increase of Cane-beetles.

The past year has proved a lucrative one for our Northern canegrowers, insect pests having, on the whole, given little or no trouble.

This, as stated in my Annual Report for 1923-24 (the following extract from which may interest cane farmers) is owing mainly to the normal activities of our grey-back having been restricted by adverse climatic conditions experienced in the Cairns and Babinda districts during the last two years.

Such check was due in both seasons to the occurrence of dry weather throughout the period September to January, whilst this insect was in its pupal and imago stages. These beetles usually emerge from the pupæ in October, remaining, however, in their subterranean pupal-chambers for three or four weeks, until thunder showers—which generally arrive about the middle of November—have moistened the hard dry soil sufficiently to enable them to tunnel to the surface.

Unless rain falls before the first or second week in December countless numbers must inevitably perish through inability to reach the feeding-trees. In 1922 the total rainfall for Cairns district during a period of five months—September to January—was 7.65 in., while the average precipitation for that period was 34.0 in. To make matters worse for the imprisoned beetles 10 points only were recorded in November instead of 413 points, the average for that month; and during December of the same year 197 points, as against the average of 919 points.

These two months, which undoubtedly cover the most critical period in the life-cycle of this pest, should have yielded collectively a precipitation of 13.32 in. instead of only 2.07 in.

In 1923, although the situation was a little easier, abnormally dry conditions again operated as an additional check on the numerical increase of this cockchafer, before it could recover from the set-back experienced the preceding year. The rainfall was 15.73 in. collectively for the similar period of five months (September to January) as against the average of 33.42 in.

During November of 1923, however, which may be considered one of the most critical months for this species, only 60 points were recorded instead of the average of 403 points; while, to make matters worse, the beetles had appeared in the pupal chambers during September owing to grubs having assumed the pupal state earlier than usual. Thus a want of sufficient rain in November proved a far greater check on the beetles than would have been the case had pupation of the grubs occurred at the usual time of year.

It is well to bear in mind that when normal seasons again prevail, there is every likelihood of this destructive cane-beetle manifesting its usual activity, more particularly in those districts where practical control measures, such as collecting the grubs and beetles, have been altogether abandoned.

21st November, 1924.

Experiment Plots at Woree.

Through the courtesy of Mr. E. C. Earle, these experiment plots were allowed to stand for about a fortnight after the surrounding cane in the paddock had been harvested.

When finally cut on 18th September, the crop being then thirteen months old, it was loaded on different trucks in order that cane from the treated and check plots might be weighed separately at the Hambledon Mill.

As a result of figures supplied by the Colonial Sugar Refining Company, it may interest growers to learn that the area (one-eighth acre), fumigated with para-dichlor., yielded 3.410 tons of cane, equal to 27.280 tons per acre; while the grub-affected cane from the check plot of similar area weighed 1.755 tons, representing 14.032 tons per acre.

Thus we find from the above figures that a gain of an additional 13.428 tons of cane per acre was secured as a direct result of this treatment.

It must not be forgotten that increased tonnage is not the only benefit one derives from a control measure of this nature, since destruction of the grubs under plant cane means also the development of healthy ratoons for the following season.

A large percentage of grub-eaten plants on our check plot at Woree were practically out of the ground, holding merely by two or three roots, which, although able in some cases to keep such sticks alive, could not supply sufficient nourishment for any additional growth, or prevent the gradual drying up of affected canes.

Degrees of Grub-Infestation.

Fortunately, the grubs in this paddock at Woree last season were confined to large patches of varying extent, such infestation causing some of the cane to collapse in places, but not being severe enough to totally destroy it. These conditions prevailed in the vicinity of our experiment plots.

During really bad seasons grubs will sometimes kill half-grown stools of cane by literally eating them out of the ground.

In such cases no amount of rain can keep the plants alive, and in a few days every leaf is brown and dead. This calamitous state of things happens occasionally to Badila growing on light friable soils.

By using para-dichlor. it should be possible to grow good crops of Badila where at present only uncertain crops of D. 1135 are being obtained.

Controlling Grubs by Means of Cultural Operations.

The influence of cultivation in connection with cane-grub control has been briefly touched on from time to time in my early reports, although up to the present the various field operations calculated to reduce grub-infestation have not been enumerated collectively.

It may be well, therefore, to mention a few common-sense means of combating this pest during its early larval condition, when occurring on small areas known from past experience to be liable to infestation.

- (1) Try to have the soil between cane rows loosened up and free from weeds by the time grey-backs appear on the wing, maintaining such cultural conditions for at least one month from date of emergence of the beetles.

By doing this one takes advantage of a habit common to cockchafer of ovipositing by preference in undisturbed ground, the hard surface of which affords a kind of fulcrum, enabling the beetle to easily maintain its correct position while digging-in. A surface consisting of loose particles is not so readily entered, the soil naturally tending to impede progress of the insect by continually falling into its tunnel during excavation.

- (2) Work the soil close to cane rows while grubs are in the first instar, and quite small. This period, which commences about a month after the first appearance of the beetles, occupies from five to six weeks.

Advantage may thus be taken of the habit common to first-stage grubs of our grey-back of feeding close to the surface within 3 in. to 6 in. of cane stools. This position brings them within reach of agricultural implements, and by stirring a strip of soil about 12 in. wide, as close to the stools as one can go with safety many of these grubs will be killed, since those sustaining minor injuries due to compression of the soil, jars, abrasions, &c., usually die a few days later. Planet Junior implements are suitable for this work, and it would pay to run through a small patch several times in the manner described at intervals of a few days.

- (3) Encourage vigorous root development and conditions favourable to conservation of moisture by judicious manuring and thorough cultivation.

Such field work not only ensures an increased yield of cane but has a decided influence also on any third-stage grubs that may be present during February at a time when cane leaves have met between the rows.

Stools surrounded during this period by a dense mat of fibrous feeding-roots—such as one finds near the surface in well-worked and manured soils rich in humus—suffer less damage as a rule from third-stage grubs than poorly-cultivated cane.

These upper roots are usually the first to be devoured, and unless an infestation happens to be severe vigorous stools in rich soil can make additional roots almost fast enough to take the place of those being eaten. Grubs are very fond of these tender fibrous roots, and generally finish every one before attacking those lower down, which supply moisture to the plant, and being stout and cord-like enable the stools to get a firm grip of the ground.

I have previously pointed out (Bulletin No. 17, p. 57) that larvæ of our grey-back are not humus-feeders to the extent often supposed by growers and others, but subsist very largely on living vegetable tissue; hence the habit noticed above, common to its first-stage grubs, of feeding near the surface on young fibrous cane roots.

Humus, however, while helping to keep the top soil in good mechanical condition for retaining moisture during hot weather, has an influence, indirectly, upon grub activity, since it tends to promote an abundant development of surface feeding-roots.

Keep fallow land reserved for early plant cane free from weeds during December to January while cockchafer beetles are engaged in egg-laying.

A luxuriant growth of vegetation between the rows is strongly attractive to egg-laden females of *Albohirtum* and *frenchi*, which usually oviposit during December and January. Grubs of the grey-back attain full growth in the space of about six months (January to June), pupating as a rule from July to September.

Those of *frenchi* on the other hand remain in the larval stage for nearly a year longer, both second and third stage grubs of this species being procurable during winter months; damage to cane, however, occurring every second year when the majority of its larvæ are in the third instar and fully grown. This cockchafer oviposits freely on grass land or among weeds, with the result that when ploughing for an early crop the grubs from eggs laid in such situations being about five months old and still small, are often overlooked or allowed to remain in the soil. As a matter of fact, however, these young larvæ have still about a year to pass before pupating, during which time they are able to cause appreciable injury; moreover, after such infested land has been planted and the weeds destroyed, they are necessarily obliged to subsist almost entirely on roots of the cane.

FIELD REPORTS.

The Southern Field Assistant, Mr. J. C. Murray, reports under date 19th November, 1924:—

Bundaberg.

The prospect for next season in this district is promising. The young plant and ratoon cane is growing vigorously, and if the present good weather conditions hold, will need constant cultivation to keep the weed growth in check. The planting of leguminous crops for green manures is becoming more general.

Growers are doing more individual experimenting with fertilisers than hitherto. Deeper and more intensive cultivation is also being carried out.

The most important feature in cane planting is, however, being more or less neglected, and that is plant selection. Many growers will remark that the planting season is a busy one, and there is no time for a close scrutiny of the plants. The majority of farmers can now recognise disease, having been pointed out to them by officers of the Bureau, or in descriptions published in reports from time to time. However, no matter what truth it may involve, the farmers should endeavour to be more observant with regard to unhealthy stools of cane.

Cane varieties making the best showing in the Bundaberg district are Q. 813, M. 1900, H.Q. 285, H. 227, and Petit Semmeville. Varieties not likely to be satisfactory in future in the Bundaberg district are, from recent observations, Black Innis, H.Q. 77, Shahjahanpur No. 10, and E.K. 1. The first two are suffering very considerably from disease. The growers are recommended to discontinue planting these varieties. B. 208 is a cane that is still growing on some farms and should be discarded. This cane is very susceptible to disease, one grower visited having at least 50 per cent. affected stools.

Taking into consideration the resistance of a variety to disease or otherwise would be a matter worthy of attention by judges of sugar-cane at the shows. Judging by c.e.s. value and the appearance of a carefully selected stool of cane is partly an error, and not in the best interests of the industry.

Several growers remarked on the shortage of cutters and chippers. There certainly appeared to be plenty of work for the hoe, as the grass and weeds were growing strongly where they were left alone for any length of time.

Mackay.

Since the beginning of the month splendid rains have fallen in this district. At present the countryside looks very promising. The young plant cane is making rapid growth. The standing crop is growing also, with a slight drop in sugar content. The farmers have had an excellent season. Since the crushing started the c.e.s. has been good and the mills have been doing highly efficient work. Cut cane is ratooning well, and there is every promise of a good yield next year. Absence of systematic green manuring is still a weak feature in farming operations. The loams that prevail in the Mackay district are for the great part deficient in humus and lose moisture very quickly as soon as dry weather sets in.

Pinnacle.

Cane varieties that are making good growth in this area are H.Q. 426, Q. 813, D. 1135, M. 1900, Seedling, and Badila. H.Q. 285 is a cane showing good growth, though as yet there is not much of this variety grown. H.Q. 426 (Clark's Seedling) is a cane that looks well at present, and is extensively grown, but farmers are advised to exercise great care in selecting plants of this variety, as it shows a considerable susceptibility to disease on some farms. Farmers are recommended to plant more Q. 813 than they are doing, excepting in places where grub infestations are likely to occur.

Recent heavy rains have caused considerable washing of cultivated soil on a number of farms that are on a slope in this area. To prevent erosion, or to check it, as much vegetable matter as possible should be worked into the soil. In addition to binding the soil, matter worked under, such as trash, cowpea, and Mauritius bean, gives the soil humus and increases the available supply of natural plant food, which is in the soil. And that is what is wanted on forest loams, such as are found in this locality. Green manuring and thorough cultivation will nearly always provide an answer to the cane farmer who puts the question to himself: "My land is running out; what shall I do with it?"

Predaceous insect pests and noxious weeds, while present, are not giving the growers much anxiety. The cane grub and wire worm are causing small losses and, while it is difficult to control the latter by mechanical means, if the farmers were to study the life cycle of the cane grub from the various papers issued by the Bureau on the subject, they could see by the excellent graphs compiled by Mr. Jarvis, the active feeding periods, and by intensive cultivation during those months do much to disturb its habitat and prevent it from manuring.

Johnstone grass and "white eye" are the more serious of the noxious weeds. The latter might be turned to some commercial value, as farmers have observed that horses are very partial to it.

Mount Martin.

The work of getting about amongst the growers was seriously handicapped by very heavy rain. The farmers are busy finishing harvesting operations, and some heavy cane was being loaded at the derrick.

A branch line starts from Glenholme and runs through this fertile district, but as there is no system of light railways, the farmers do the transporting of the cane by horse wagons. The soil in this locality is a medium quality forest loam, with about a foot of top soil, and a substrata of light loam interspersed with gravel.

The reaction of the soil is slightly acid. Whenever it is possible to do so, farmers are recommended to green manure and try liming.

Cane varieties making good growth in this locality are: Malagache, D. 1135, and N.G. 38. Clark's Seedling does not generally give good results in this area. The farmers are recommended to plant M. 1900 Seedling and H.Q. 285.

Disease (Mosaic) is showing in places in the N.G. 38. As the necessity for careful selection has been pointed out earlier in this report, there is no occasion to further stress the point.

The roads to this locality could be improved.

The Southern Field Assistant, Mr. J. C. Murray, reports under date 5th November, 1924, as follows:—

Mount Bauple.

Crushing in this area is proceeding smoothly. The c.e.s. content is fairly high, although occasionally a low test is registered. This may be due to other causes, but it is almost certain that it is due to diseased patches of cane being sent to the mill, unless, of course, the cane is immature.

Growers are doing good work in regard to their agricultural methods, although more green manuring would be beneficial.

There is a large number of varieties in this district, but the best appear to be M. 1900, Q. 813, and H.Q. 285. Other canes making a good showing are Q. 970, N.G. 64 Sport, E.K. 28, D. 1135, H.Q. 426, M. 189. A factor the growers must always keep in mind in planting cane is the particular varieties resistant to disease. A cane is really valueless if it is a variety susceptible to infectious disease. Q. 813 is resistant to Mosaic disease and "gumming," and other infectious diseases of lesser economic importance. H.Q. 285 is resistant to Mosaic, but tolerant of "gumming" and resistant to minor diseases. Q. 970 is a cane that is fairly resistant to disease. N.G. 64 Sport is a susceptible variety. E.K. 28 is a fairly resistant variety to Mosaic disease, but recent observations suggest that it is susceptible to gumming. D. 1135 is a variety that is tolerant of gumming disease, but is fairly resistant to Mosaic. It is a variety that should be gradually worked out, or most carefully selected before planting.

Root-destroying fungi were active in places where soil conditions were poor. In some instances roots were completely destroyed by this secondary attack. Growers are advised to drain and lime their soil when they note any attack of root-destroying fungi.

Speaking generally, the Mount Bauple district is looking well and the outlook is promising.

Yandina and North Arm.

Very heavy crops are growing in these districts. Growers were busy cutting their allotments at time of visiting, but it is very doubtful if the milling strength is sufficient to cope with the present crop.

Cane varieties making the best showing in these districts are H.Q.285, Q.813, and M.1900 Seedling. The latter requires very careful selection when planting. This variety is beginning to deteriorate in Southern Queensland, owing to careless and unconscious selection of bad sets.

Growers are advised to plant a little deeper than they are doing at present. Owing to the abundant rainfall in these districts the cane grows quickly, becomes top heavy, and falls down. It would establish a better root system in the soil if planted, say, 9 in. deep, and subsequently cultivated properly.

The reaction of the soil in these districts is acid. Judging by the colour and texture of the soils, green manures and light dressings of lime would be beneficial.

Insect pests are not causing the growers much loss in these localities. A small black beetle (*Pentoden australis*) appears to be troublesome wherever there is paspalum grass, also a grub corresponding in description to the larvæ of the grey-back beetle is causing minor losses. The growers must, however, take the question of plant selection very seriously. Farm workers should interest themselves in this matter as well as the growers, for without their co-operation it is almost impossible to keep the fields healthy.

Beenleigh.

There are five mills in this locality. The largest, belonging to Mr. Heck, is doing excellent work. Farms in the vicinity have been linked up with 6 miles of tramline. Heavy crops are being taken off, the canes making the best showing being Q.813 and D.1135.

Soils on the river flats are naturally rich, and farmers have maintained the fertility by crop rotation, thorough cultivation, and a minimum of burning. Heavy fires on cane lands, especially volcanic, are a distinctly bad feature, and where possible cane-cutters should not insist on so much burning. It is altogether inexcusable, say, to burn M.1900 Seedling. It would also pay many growers much better to "work in" cane trash than destroy it.

A considerable number of stools were found affected with Mosaic. The common form this disease was taking in the Beenleigh district was, as regards the primary symptoms, a number of pale, short streaks in the normal green tissue, parallel with the midriff, not meeting, but alternate, a folding of the leaf and mottling of the rind of the cane with an unhealthy shrinking of the nodes. It is a disease easily recognised and growers should make a careful survey of their fields before planting.

Nambour and Coolum.

The crops in these districts could be described as heavy. An exceptionally open winter preceded the crushing and this factor, combined with extension of areas, has given these districts a record tonnage. If events prove that the sugar surplus can be satisfactorily dealt with, the milling accommodation must be increased in these districts. An important aspect of the question of exporting sugar is the efficiency of farming. If the tonnages per acre are increased by scientific farming and the purity of the cane juice is not interfered with by disease in the cane, the growers have no need to be unduly pessimistic as to the future. The efficiency of farming is increasing in these areas, however, and it is noticeable that growers are making more effective drains and making more use of lime and green manures.

Cane varieties making a good showing in these districts, are E.K.28, Q.813, H.Q.285, Gingila, N.G.15, and on the higher lands, M.1900 Seedling. On the top of the hills west of Nambour the varieties Q.970, Q.1121, and Q.1098 are worth planting. D.1135 is largely grown, but is showing "gumming" disease to a considerable extent.

Very considerable progress has been made at Coolum. The farmers have overcome the drainage difficulties and the country side is developing a clean, well-cultivated appearance.

The soil down here (Coolum) has strongly acid reaction, and it is probable that lime would materially assist the farmers to improve the texture of these soils. "Gumming" disease is in evidence, especially in wet patches. This may be due to a lowered point of resistance in the cane through bad soil conditions.

ENTOMOLOGICAL HINTS.

The following remarks, unless otherwise mentioned, apply to cane land lying within a radius of about 20 miles from Meringa Experiment Station. Farmers desiring additional information regarding the control of cane pests are invited to consult the Entomologist, either by 'phone (95 Gordonvale) or letter, addressed:—"Meringa," Private Bag, Cairns.

Concerted action taken at the right time will often go far towards minimising injuries caused by our more serious cane pests, and whilst not unduly trespassing on daily activities of the cane farm, would tend to benefit growers financially.

Appearance of Small Brown Cockchafer:

The well known cane-beetle *Lepidiota frenchi* will emerge during this month in countless numbers on forest country, and from small areas of cane land where third-stage grubs of this pest proved injurious to young ratoon and plant crops in September and October, 1923.

During the present season cane will, however, be free from such attack, owing to *frenchi* having a life-cycle of two years, so that no damage need be expected until September, 1925, when third-stage grubs of this species will again be in evidence.

Although one of our serious cane-beetles, second to *albohirtum* in economic importance, this insect fortunately oviposits, as a rule, in uncultivated soil densely covered by grass or weeds, &c. Thus, it behoves growers to maintain during December and January a system of clean culture on areas devoted to cane, and more particularly on fallow land that may be reserved for early planting. Both *albohirtum* and *frenchi* lay their eggs during these months, and are strongly attracted by a luxuriant growth of vegetation between the rows, so that land in a weedy condition is almost sure to become badly grub-infested.

Treatment for Moth Borers.

Young cane shoots showing "dead hearts" (browning of the central leaves) should be cut out about 2 inches below ground level, and either burnt or crushed to destroy caterpillars of moth borers; three species of which are at present in the larval condition.

Stealing a March on the Weevil Borer.

Keep an eye on the growth of cane on river flats and areas where this borer is likely to occur, and if discovering evidence of this pest having commenced to attack the basal portions of canes, communicate at once with the Entomologist at Meringa. Tachinid fly parasites will be released by the Sugar Bureau free of charge on areas affected by this cane-borer, on the condition that growers will agree to leave about a quarter of an acre of cane sticks harbouring borer-grubs for the flies to breed in. Such cane must be left uncut for at least three months from date of liberation of the parasites, and must not be burnt.

"Greybacks" on the Wing.

As foretold last month, cane-beetles made their appearance towards the middle of November, fair numbers being noticed on feeding-trees at Highleigh and elsewhere.

Growers noticing quantities of beetles on food-plants near headlands, would do well to collect and destroy same. Such control work would prove profitable during a period of about six weeks following the date of emergence. The position near headlands of such favourite trees as native figs—(both weeping and broad-leaved varieties)—and Moreton Bay gums (*Eucalyptus tessularis*), should be located without delay, since these food-plants usually attract many greybacks and are worth visiting daily.—EDMUND JARVIS, Entomologist.

CANE PESTS AND DISEASES.

The Director of the Bureau of Sugar Experiment Stations (Mr. H. T. Easterby) has received the following report (3rd November, 1924) from Mr. W. Cottrell-Dormer, who is investigating pests and diseases of Sugar-cane:—

Both from the point of view of Entomology and of Pathology there is room for a great deal of original investigation in the Isis areas, as pests and diseases occur here which have not been met with elsewhere.

Mount Bauple.

Diseases.—Of the more important infectious diseases of sugar-cane only one was actually observed, though others may, of course, have been present to a slight extent and in a dormant state; this disease is Mosaic and was found scattered more or less throughout. The actual damage being at present sustained from it is small where the district is taken as a whole. However, blocks here and there were seen where the damage was really appreciable. This was especially the case where the affected cane was growing in close proximity to the variety known as Shahjahanpur No. 10. As is now well known this variety has shown a marked susceptibility to Mosaic disease; not only is this the case, however, but, furthermore, Mosaic disease appears to spread more readily from it than from other canes. Now Mosaic is, as far as is known, entirely dependent on insects for its transmission from plant to plant, so that the reason for this dangerous quality may be that the insects responsible for the transmission of Mosaic prefer it to other canes. Whatever be the reason, growers should be warned against growing any other varieties close to Shahjahanpur, or if for some reason a farmer is obliged to do this he should only grow a variety known to be resistant in this situation (Q. 813 is such a cane); in any case the grower should desist from further planting Shahjahanpur.

Knife cut disease was encountered on almost every farm, but the damage at present being done by it is negligible as only sticks here and there are to be found affected. This disease was found only in the variety D. 1135, which is the staple cane of the district and, so far as records show, the only cane which is subject to the disease.

At Gundiah a very acute form of root-disease was encountered. This disease is locally known as "Foot-Rot," and is probably a severe infection of *Marasmius* sp. (*sacchari*?), but as I was unable to find fructifications of any kind further investigation would be necessary to settle this point. The disease appears first to attack the lower roots in the soil and causes these to die altogether and gradually works upwards, and eventually kills practically all of the roots of the affected stem. Aerial roots are then formed by this stick which find their way into the soil to replace the diseased roots. If the weather is suitable for the development of these roots the cane will survive but will remain stunted; if, on the other hand, conditions remain suitable to the disease these new roots are also attacked, which has been the case in this instance. The fungus then makes inroads into the stick itself through the roots, so that at the base of infected sticks a brown band can be seen, where the roots have been, around each node. This band consists of the decayed tissue of the stem, is dry at this time of the year, and if scraped with a knife will crumble away very readily to a depth of about one-sixteenth of an inch. The effect of the disease on the stick is to cause it to remain badly stunted or even to kill it, and to cause it to lodge on the ground, being devoid of roots for support. I would suggest the following practices for the control of the disease:—(1) Seed selection, *i.e.*, the avoidance of infected material for planting purposes so that as little as possible of the fungus may be introduced with the plants; (2) when the cane is ploughed out, in cases like those observed at Gundiah where serious damage is being sustained, all stools should be carried off from the field thus removing the worst source of further infection; (3) rotation of crops, with plants belonging to a widely different botanical order to cane; such as cowpea and other leguminous crops—corn is too closely related to cane and often serves to carry cane disease from crop to crop. While the soil is being spelted it should be turned over as frequently as possible in order that full advantage may be taken of the sterilising influence of the sun.

Insect Pests.—The Mount Bauple district is remarkably free from insect pests, the only ones observed being the large moth borer and the minor sap-sucking insects usually found on cane. The moth borers at times do serious damage over small areas.

Isis.

Diseases.—Gumming Disease, Mosaic, Acute Root Disease, and a disease very much resembling Ilia, if not identical with it, are the more serious diseases at present showing in the Isis district.

Gumming disease was observed throughout most of the district to a greater or less extent, and more particularly in the following localities:—Horton, Doolbi, North Isis, Huxley, Hapsburg, and Cordalba. It was not seen at South Isis, but as only a very brief visit was paid to this locality it cannot for that reason be declared free from gumming. Very little actual damage is being done by the disease, but a few fields in the North Isis are being seriously affected. The variety D. 1135 is the one which is by far the most infected, but sufficient healthy cane probably remains in the

district from which to select clean plants; however, it will require concerted effort on the part of the growers to find out just where this is to be obtained. The best means of detecting gum in the field is by the leaf-symptoms of the disease. These consist of irregular dead longitudinal streaks in the leaf. The very tip of the leaf is dead, and these dead streaks continue downwards from the dead tip (though dead patches are sometimes found in the leaf away from the tip, but not usually on D. 1135). The streaks vary in length from 2 in. or 3 in. to as much as 12 in. Where there are several of these streaks the portions of the leaf lying between them are usually of a quite normal green without any tinge of yellow unless the leaf be an old one. A variety of causes may bring out dead streaks in cane leaves, but these streaks are characterised by always having a very narrow dull-red margin, and by being prolonged at their lower end (where the streak originates at a dead tip) into a fine irregular broken yellow line with here and there a dot of red. If the tissue of this broken yellow and red line be examined with a high-power microscope it is found to contain tremendous numbers of the microbes which cause the disease (*Bacillus vascularum*), so that the dead streaks are the result of the activities of these microbes and follow the advance of the yellow line.

The leaves of the diseased sticks are very much wilted and if these sticks were cut open the gum would very soon exude from them. It should be noted that by the leaf symptoms gum can be detected before there is sufficient of it to be caused to exude from the stick, hence the value of the method. However, as the streaks only appear at certain times of the year differing more or less in every district, a constant watch should be kept so that when they do appear advantage may be taken of the opportunity for selection of blocks to be kept for later planting. Mosaic disease is present throughout, but as most growers are able to detect it the disease is being kept at a minimum by roguing and by plant selection. Root disease of an acute nature, similar to the "Foot-Rot" described in the Mount Bauple notes, was found attacking the M. 1900 seedling in most localities. The disease, so much resembling Iliau, is doing slight damage throughout, and serious damage in the North Isis and parts of the Lynwood locality. The disease consists of an exceedingly tight binding of the leaf sheaths of young plant and ratoon cane by a copious growth of fungus in the spaces separating the leaf sheaths. This growth binds the bases of the leaves so very tightly that the latter cannot be separated without tearing. The result of this affliction is that the growing point of the shoot is unable to grow any further in an upward direction and so swells laterally and bursts the binding leaves, often forming a great bulb-like projection on one side of the shoot.

While this is going on the young tissues of the stem are attacked by the fungus (*Melaconium iliau?*), and the stem in most cases is killed. The disease was seen in several varieties (H.Q. 458, Q. 813, D. 1135, M. 1900 Seedling), but was at its worst in M. 1900 Seedling. With regard to the control of this disease the methods suggested under "Foot-Rot" in the Mount Bauple notes could be tried.

Insect Pests.—The most serious insect pest in the Isis district is the cane grub, which was identified in 1921 as *Pseudholophylla furfuracea* (J. F. Illingworth, Bull. No. 16, 1921). This grub very much resembles that of *Lepidiota frenchi*, but can be readily distinguished from it by the fact that if it be placed on a piece of level ground it will soon slowly move away by crawling on its back, which *frenchi* never does. There is every need for a systematic study of the life history and habits of this grub before chemical control can be contemplated. There is no doubt that great differences could be found in the habits of this species of grub and those of our Northern ones; differences in feeding habits, for instance, which would lead to discoveries of suitable baits for poisoning or of satisfactory trap crops. During my visit I met one grower who had tried carbon bisulphide as a fumigant for these grubs and had obtained good results. The soil, being of a very loose and friable nature, is very much suited to this form of control. The method at present in general vogue for the control of this pest is the old and good one of collecting both grubs and beetles. By clearing the land in this way the insect is largely checked. Other factors known to control the grub in these parts are the digger wasps, the Muscardine fungus, and mites, though there is some doubt as to the true function of the latter.

Wire worms, moth borers, and white ants (*Termes* sp.) are other insect pests which are responsible for slight injury to crops in these parts.

Cane-killing Weed.—The cane-killing weed was found doing appreciable damage to a crop of first ratoon D. 1135 in fairly "new" forest land at Horton. Several fairly big patches of the affected block were almost completely killed out through the agency of this weed (*Striga* sp.).

20th November, 1924.

Bundaberg, Fairymead, Bingera, Bucca, Gin Gin, Avondale, and Yeppoon were included in the districts visited.

DISEASES.

Leaf Stripe.

As there is a great deal of confusion, from the average farmers' point of view, between this disease and Mosaic, it would not be out of place for me to give a brief description of Leaf Stripe. In its early stages the symptoms of this latter disease resemble somewhat those of Mosaic, and if one were not acquainted with both, Leaf Stripe might be taken for Mosaic. In both diseases certain irregular longitudinal markings are found on the leaves. In Leaf Stripe these take the form of irregular light-yellow lines which run along a group of veins in the leaf. These lines are seen to be actually of a light-yellow colour, which is of itself sufficient to distinguish it from Mosaic disease where the markings are not long enough to be called lines or stripes and are rather of a light-green colour—i.e., of a lighter green than the remainder of the leaf. Another very clearly defined distinction is that in the case of Leaf Stripe a light downy growth of white fungus is seen on the under side of the yellow stripes, this fungus being the actual aerial growth of the parasite which causes the disease. The presence of this fungus has led to the synonym "Downy Mildew" of sugar-cane. The disease is a very serious one, indeed, as the affected stem is invariably killed by the fungus if it is not cut previously. Again, the disease is very contagious, being spread in the form of spores, or germs, by the wind, so that should these spores lodge on a receptive leaf the fungus will rapidly infect the stool and spread further. And, furthermore, a diseased stick when used for plants will produce diseased stools. Thus when a stool is seen to be infected it should be uprooted and burnt at the earliest opportunity. Where a whole field is found to be diseased it should be ploughed as soon after cutting as possible, and previous to cutting the cane should be burnt, as by this means many billions of virulent spores will be destroyed.

The disease was found doing damage at Bingera where a variety known as B. 156 has proved quite unable to offer any resistance whatever to this serious disease. Other varieties attacked included Shahjahanpur No. 10 (rather badly), 7 R. 428—Pompey (rather badly), H.Q. 409 and D. 1135 (lightly). Mr. A. Gibson, who is very well acquainted with the disease, informed me that he had also found Leaf Stripe in a couple of stools of Uba which were growing near diseased cane. A variety which appears from observations at Bingera to be very resistant to the disease is N.G. 16.

Mosaic.

This well-known disease was met with in all the districts visited. It does not appear to be doing serious damage in the outlying areas of the Bundaberg district, but the loss caused by it in the coastal localities (Woongarra and Fairymead) can well be considered as important. Especially is this the case in the Woongarra, where it would be perhaps impossible to find a field of cane free from Mosaic. Many fields show infections as great as 20 per cent., the affected stools being invariably stunted. These high infections were particularly observable where Johnson grass occurred in the field. This grass harbours, as a rule, many plump little blue-coloured aphides which there is small doubt are able to carry the disease. These aphides are also found at times on corn and sorghum which, with the Johnson grass, are known to be subject to sugar-cane Mosaic. At certain times of the year these aphides occur in a winged form, and being but poor fliers are buffeted about by the wind when they take wing if the wind is at all strong.

One grower mentioned to me that he found that supplies contracted the disease more readily than the usual plants. He showed me a field of D. 1135 first ratoons where misses had been made up, when the cane was in its plant stage, with Black Innis carefully selected to be as far as was possible free from disease. Yet at the present time almost 100 per cent. of these misses are infected with Mosaic, while the D. 1135 is comparatively free. Now to the north-east—i.e., to windward of this block, which was almost perfectly free from weeds—was a field of volunteer ratoons, recently cut, which was in a state of neglect, being simply overgrown with Johnson grass. On the Johnson grass were found quantities of the blue aphides. Thus it seems that the failure of the supplies was probably due to three causes—(1) Black Innis is a very susceptible variety to Mosaic; (2) supplies are usually of lower vitality than normal plants, being overcrowded by the latter; and (3) Mosaic is known to attack Johnson grass, and the disease could very well have been carried to the cane by the little aphides which would be blown from time to time into the cane from the grass by the strong north-easterly winds which are prevalent here. Thus, as is the case with all other diseases in plants

remedy lies in strong co-operative effort on the part of the farmers in infected areas in the eradication of disease-carrying plants from their fields, roguing of diseased stools where this is practicable, and the planting of healthy cane only.

The disease was found in only one small block of cane at Yeppoon. This block is being destroyed, so it is to be hoped that the disease has not yet found its way into the local grasses.

Gumming.

Gumming disease is probably fairly widespread in the Bundaberg districts, but as the characteristic leaf markings which show its presence were not very evident at the time of my visit, little of the disease was observed. A great deal of the D. 1135 at South Kolan was found to be infected, but is not suffering serious injury therefrom. The disease was also met with at Margam, Windermere, Greenville, and Fairymead in the varieties D. 1135, H.Q. 426, and M. 1900 Seedling; while it was reported to me from Springfield and Gin Gin.

Foot Rot.

This fungus disease is well worthy of mention, as it is responsible for severe loss to growers in plants which it kills when very young. Where a plant manages to survive the fungus attack the stool remains a weakling throughout its life. Studies of this disease should be made at the earliest opportunity. Growers are referred to the writer's report on the Mount Bauple district, published in November.

Minor Diseases.

Under this heading can be recorded the finding throughout the districts visited of obscure root diseases which, while very seldom causing total destruction of cane, must cause appreciable annual loss of tonnage. These root diseases are generally brought about by inauspicious soil conditions, and can, as a rule, be remedied by application of suitable manures or by improved cultivation. Another disease of minor importance observed at Bundaberg is that known as Cytospora Rot, a fungus disease which was brought to my notice by Mr. North, Pathologist to the Colonial Sugar Refining Company, who was visiting the district.

INSECT PESTS.

Grubs.

Several species of cane grubs not usually met with in the far North were found doing great damage to crops in some of the districts visited, especially Gin Gin, Bingera, and Bucca. Two grubs in particular are responsible for these depredations—*Lepidiota* sp. 666 (or a very closely related species) and *L. grata*. Both of these, it seems, have a two years' life cycle. Both attack young plant cane as well as mature cane. Their joint efforts have meant a loss of many acres of otherwise healthy cane to some Gin Gin farmers. At Bucca the loss has not been so great, while at Bingera this pest is controlled fairly efficiently with carbon bisulphide. *L. 666* is a grub which attains a length of about 1½ in., and, though smaller, very much resembles *L. frenchi*. *L. grata* is a smaller species, and is almost a replica of *L. rothei*. From statements made by growers in these districts, it would appear that *L. grata* emerges with the early thunder showers in October, while 666 does not come out until November. Both have but a short evening flight. There seems some doubt as to whether the eggs are ready to lay on the emergence of the beetle—i.e., whether it is necessary for the beetles to feed before laying. As there is talk of forming a Beetle Board in the Gin Gin district, the growers would be well advised to conclusively settle this last-mentioned question before planning their collecting campaign, since efficient control by collecting is, to a large extent, dependent on an accurate knowledge of the ovipositing habits of the female beetle. Owing to the shortness of my stay in the district, I was unable to touch on this aspect of the matter. It was very gratifying to note that one grower at Skyring's reserve was preparing to control the pest with carbon bisulphide during the coming season. As in normal seasons the damage occurs in small patches, this form of control is very good. By pulling up a stool here and there a while before the grubs usually do their damage, the location of the grub centres could be ascertained simply by finding the young grubs under the stools. These spots could then be treated, and a great many stools saved for each one destroyed in the search for grubs. Further information on this phase of grub control could be obtained by communicating with the Entomologist of this Bureau (Mr. E. Jarvis), Meringa, near Cairns.

The Black Set-Beetle and Wire Worms.

The Black Set-Beetle (*Pentodon australis*) was found damaging young cane shoots throughout most of the Bucca area. This beetle is in the habit of attacking young shoots of plants near the point where these join the set, and very often they

attack the set itself by boring holes into it. As a rule, the damage caused by this insect is not serious, since the affected shoot will often shoot up again from below the spot where the beetle has gnawed it. But sometimes a small epidemic of beetles will occur, and the cane will suffer accordingly; especially is this the case where the land has been growing paspalum grass previous to sugar-cane, as the roots of this grass are very much favoured by the beetle. The beetle is a small, compact shining-black insect, little over half an inch in length, so that it cannot very well be mistaken when found about the plants. Control measures are not warranted as yet. A pest which causes similar damage to the Black Set-Beetle is the wire worm. It is very probable that the wire worm is often blamed for destruction wrought by the beetle. The wire worm was complained of by growers in most parts of the districts, but especially at Gin Gin and Bucca. One grower in the former district stated having found the dusting of plants with a little slaked lime a very efficient method of prevention for wire worms. This should be done by throwing about a quart of slaked lime on to the plants while these are in the planter.

Other Insect Pests.

The large Moth Borer was found effecting more or less injury throughout, particularly in dirty fields. Adults of *Dasygnathus australis* were captured at Bingera and Gin Gin. The beetles *Isodon puncticollis* and *Neso flavipennis* were met with at Bundaberg.

TOMATO CROPS—FERTILISER TRIALS.

Mr. N. A. R. Pollock, Northern Instructor in Agriculture, supplies the following results and remarks on a series of trials with various mixtures of fertilisers on tomato crops in the Bowen district during the season just concluded.

The fertiliser mixtures were at the rate of 200 lb. per acre, applied broadcast on the soil in even quantities, for each plant in a circle of 5 feet diameter of which the plant occupied the centre and worked into the soil with the cultivating implement. The fertiliser mixtures were as follows:—

Plot.	Super.	S. Potash.	S. Amm.	Earthy Lime.	Approximate Cost.
	Lbs.	Lbs.	Lbs.		£ s. d.
1	140	40	20	..	1 0 0
2	120	30	30	20	0 18 7
3	120	40	40	..	1 2 0
4	120	30	50	..	1 2 0
5		Control no	Fertilizer.		
6	120	20	60	..	1 2 0
7	100	30	70	..	1 3 10
8	180	30	70	20	1 2 6
9	100	50	50	..	1 3 10

In the foregoing Super. stands for Superphosphate, S. Pot. for Sulphate of Potash, and S. Amm. for Sulphate of Ammonia.

As regards the percentage of Phosphoric Acid (P), Potash (K), and Nitrogen (N). The mixtures show—

Plot.	(P) %	(K) %.	(N) %.
1	12	10.4	2
2	10.2	7.8	3
3	10.2	7.8	4
4	10.2	10.4	5
5	..	..	..
6	10.2	5.2	6
7	8.5	7.8	7
8	6.8	7.8	7
9	8.4	13.0	5

The experiments were carried out on the farms of Mr. T. Moller, Bowen, N. Earl, Don Delta, and C. E. Jones, Euri Creek. The yields on each worked out to an acre for each plot are—

Plot.	MOLLER.	EARL.	JONES.
	Lb.	Lbs.	Lbs.
1	6,880	16,970	16,920
2	6,500	14,600	18,360
3	6,450	14,610	14,840
4	7,170	16,370	16,780
5	4,020	16,670	16,640
6	5,390	19,220	15,900
7	4,960	19,000	19,940
8	4,930	19,080	21,160
9	5,360	16,770	19,360

Mr. Moller's plot proved to vary greatly in the quality of soil, and beyond proving the benefit of the application of fertiliser, the result does not, in comparison with the results of Messrs. Earl and Jones' plots, point to any definite conclusion.

Messrs. Earl and Jones' plots proved to be on soil of more even quality, while the yields with each mixture, except in two instances, agree very closely.

Mixtures in Plots 7 and 8 show the best results on each of these farms, that on No. 8 being best. This mixture is very close to the fertiliser placed on the market for sugar farmers as .7.7.7, or "Three Sevens," which can be recommended for trial during next season.

The various mixtures were prepared with a view to testing increase in yield, effect on foliage, flavour, quality, and weight for size of fruit. On all the fertilised plots the fruit was superior to the control or non-fertilised plot, while the plants showed better colour and more leafage.

For general excellence in yield and quality of fruit, Messrs. Earl and Jones agree in favouring Plot 8.

It may be noted that Wilt resistant varieties of tomatoes were grown, and there was no disease noticeable on any of the plots.

In the yields given, all fruit, whether marketable or not, is included.

THE FARMERS' WOOL SCHEME.

A YEAR'S OPERATIONS.

The operation of the farmers' wool scheme for the year ended 30th June, 1924, shows a substantial increase in new business and amount of treated wools sold. The only losses of clients are those who, by increase of the numbers in the flocks, automatically drop out. The limit is 1,500 fleeces.

Wool was sold at the various sales during the year to the amount of about £6,000, and the number of fleeces in individual flocks ranged from one fleece up to eight bales. The total number of finished bales was 263, and the average price per bale worked out at about £22 per bale for all qualities. The prices of the various qualities work out—

Type.	Highest.	Lowest.
Merino fleece ..	31d.	19½d. per lb.
Merino hoggets ..	31d.	21½d. per lb.
Merino pieces ..	26½d.	17d. per lb.
Merino bellies ..	22½d.	16½d. per lb.
Merino stained ..	15d.	12½d. per lb.
Merino locks ..	11d.	10d. per lb.
Merino lambs ..	26½d.	15½d. per lb.
Comeback fleece ..	30d.	14d. per lb. (Burry)
Comeback hoggets ..	31d.	21½d. per lb.
Comeback weaners ..	21½d.	13d. per lb.
Comeback lambs ..	21½d.	13d. per lb.
Crossbred fleece ..	26½d.	10d. per lb.
Crossbred pieces ..	21½d.	15d. per lb.
Crossbred bellies ..	18d.	18d. per lb.
Crossbred stained ..	12d.	12d. per lb.
Crossbred locks ..	8½d.	7½d. per lb.
Crossbred hoggets ..	25d.	21½d. per lb.

The crossbred wools showed a very big advance on the previous year's figures, and it seems as if the prices for farmers' wools have reached a very lucrative level. The scheme is now thoroughly established and retains the confidence of the smaller holders.

Season and Blowflies.

The season in Queensland was very dry up to about March, and in that month general rain fell in bounteous measure. With the advent of rain, blowflies made their appearance almost everywhere. This was to be expected. The palliative offered by the experiments at Gindie and Dalmally wherever used gave excellent results. The Queensland formula of jetting arsenic into the breech of the sheep has now been formally recommended by the New South Wales Government. It has borne the test of time in giving at least a two or three months' protection.

Stomach Worms.

Another pest which is attaining serious dimensions is the Stomach Worm (*Strongylus contortus*). It is about time that a combined effort on the part of pastoralists and others be made to control the plague. I am seriously of opinion that the worm pest is worse than the blowflies. The worms we have always with us, while there is often absence of the flies, especially in dry weather. The worm pest, too, induces the flies to attack sheep where a healthy flock often escapes. A method of attack successful on the pest is outlined in the "Farmers' Sheep in Queensland" Bulletin, p. 34.

Lambing.

Since the rains in March and later, there has been an excellent lambing over the whole State, and there is every prospect of a good spring. Many visits have been made to farmers and others during the year. Included in these was one to the Tableland, where, after inspection of most of the country, six lectures were delivered to groups of farmers. It was found that there is no part of Queensland more suitable for small flocks of sheep, and there is a strong movement on the part of farmers to acquire a small flock, as everywhere else in Queensland, dogs, wild and domesticated, are the great drawback to the keeping of sheep. Something must be done in the direction of dog control, or sheep keeping, the most lucrative of callings, will be hampered so much that many will drop out of the business, while hundreds of farmers are afraid to take it on. It is really a national question. Lectures were given at other centres such as Springsure, Capella, Gatton, Purga, and other centres.

Coastal Sheep.

There is still going on a movement to put sheep on the coastal areas. Several cattle holdings are being converted into sheep properties, notably at Gin Gin and Beaudesert. Small flocks are established here and there from the Tweed River to Burketown on the Gulf, while nearly every island along the coast, including Moreton Island, is stocked with sheep.

Practically the whole of the sheep districts of Queensland were visited in the course of the year by your officer.—W. G. BROWN, Instructor in Sheep and Wool.

WHEAT CROP ESTIMATE, 1924.

Districts.	GRAIN.		HAY.		GREEN FODDER.
	Acres.	Bushels.	Acres.	Tons.	Acres.
Darling Downs ..	161,678	2,426,973	9,531	11,061	17,242
Maranoa	14,369	254,396	700	1,050	6,000
Wide Bay	1,256	21,070	317	536	597
Moreton	476	9,775	3,104	4,834	1,715
Other .. ..	..	..	95	76	266
Total State, 1924 ..	177,779	2,712,214	13,727	17,557	25,820
Total State, 1923 ..	51,149	243,713	8,714	5,095	116,644
Increase, 1924 or —Decrease, 1924	126,630	2,468,501	5,013	12,462	— 90,824

From recent reports it seems likely that this estimate may be slightly in excess of the crops harvested

BANANA GROWING AS SUCCESSFULLY PRACTISED IN THE KIN KIN DISTRICT, NORTH COAST, QUEENSLAND.

By C. N. FREEMAN.

Mr. Freeman is one of the most successful banana growers in Queensland and his product has created and sustained a creditable reputation on Southern markets. A graduate of Hawkesbury Agricultural College, Mr. Freeman gained further practical fruitgrowing experience at the Wagga Experimental Farm and on the Yanco Irrigation Settlement. Later he purchased land at Kin Kin, in this State, after some experience of banana growing on the Tweed.

The principles of banana culture, as set out, have received the endorsement of the Fruit Branch of the Department of Agriculture and Stock, and are applicable to Southern and Central Queensland, and, with slight modification, the State generally.. The instructions given and recommendations submitted cover every phase of profitable banana growing.

The information courteously supplied by Mr. Freeman, being the outcome of personal experience in the Kin Kin district, will be appreciated by both new and old established planters. His advice is sound, and is backed by practical and profitable results, and may be followed without hesitation by growers bent on securing a maximum of material benefit.—Editor.

Selecting a Site.

In selecting a site suitable for the growing of bananas great care should be exercised as this is probably the most important feature of the business. A rich friable scrub or bastard scrub soil above frost level is preferred, yet in some forest lands containing a quantity of rotten shale they are found doing well, but in any case there should be perfect underground drainage and the soil must be loose. The banana plant loves warmth balanced nicely with moisture both in the soil and atmosphere, and an easterly to nor'-easterly aspect, close to the sea, with a good annual precipitation, gives these requirements. In abnormally dry seasons well sheltered northerly positions are too hot, but in wet seasons the plant simply revels in the conditions as both heat and moisture are balanced. With the easterly aspect also a plantation is sheltered from the cold westerly winds, but sometimes exposed to the southeast weather prevailing in the wet season (January, February, and March) in which case a belt of scrub should be left standing. One must also consider the capabilities of the site in the transportation of the fruit to the road level.

The best time to fall the scrub is in May or June. It will then have time to dry and allow the bark of the logs to crack ready to be fired in suitable weather in October or November. After the fire all small pieces not burned should be picked up and the ground cleared as much as convenient, and the time thus spent will be well repaid later on. Tracks of from 4 ft. to 6 ft. wide should be made in easy grades to facilitate the drawing of the suckers at planting time and later on the fruit.

Holing.

In digging the holes it is advisable to use sight sticks and a rod cut to the required length for marking so as to get them in line and as near as possible the right distance apart. A big hole should be dug not less than 15 in. wide at the top and bottom, the depth governed by the class of soil. If it be particularly deep and loose 16 to 18 in. is advisable, and if inclined to bake, say, 15 in.; but no hard and fast rule should be set out when digging. In preparing a hole the top soil should be left at the top side as this can be used when planting the sucker. There is a diversity of opinion regarding the distance apart that bananas should be planted, and it is generally conceded that it all depends on the care and method exercised in the suckering. If planted 9 ft. to 12 ft. apart two or three suckers can be left to ratoon, but if planted from 6 ft. to 8 ft. one sucker only can be left, in such a way that one bunch only per year is harvested. The usual practice, however, is to plant 10 ft. to 12 ft. apart.

Selecting Suckers—Planting.

All holes should be dug before the digging of the sucker from the parent plant is proceeded with. Although a sucker takes considerable time to completely dry out or die it is advisable to plant as soon after digging as possible. In selecting a sucker for planting old stools that the grower has decided to allow to run out are

preferred to take them from, but the plantation must be clean of weeds, diseases, pests, &c., and the sap flowing freely through the plant, and this time coincides with the time of planting—December-January. In any case suckers should never be taken from plants before or on their first bunch, as they are usually very soft and a great deal of damage is done to the parent and sucker owing to their depth in the ground. The type of sucker to select is one showing a big round corm and a short cone top with no leaves and about as large as the two fists together. It will be found difficult to obtain them all the same size, but desirable to have them as near as possible alike. The crowns of big suckers are satisfactory providing the centre is scooped out and only one life left and a good slice of the bottom cut away, as the best roots come away from the level of the eye. These crowns can be cut in two or three sections, providing there is an eye for each section. A good tool for removing the sucker from the stool is a wide spud bar with a long pipe handle. After digging, the roots adhering to the sucker should be cut close up to the corm without damaging it. Remove all eyes from the sucker also.

When planting put the side of the sucker that has been severed from the parent facing down hill so as when the plant grows and the young suckers appear they will be at the back of the plant. The soil on the top side of the hole can now be pulled in and tramped firmly about the sucker or crown, and in the case of very small suckers they can be completely covered but by not more than 2 or 3 in.; in any case the hole should not be filled, and as the suckers grow a hole similar in shape to a saucer retained around the plant. This will tend to keep the subsequent suckers and roots well down.

When to Plant.

As mentioned above, December and January are the best months to plant. In the first place the selected sucker is growing and all wounds to the corm will callous up and the plant will strike immediately. They will do this much earlier in the season and later too, but there are other considerations. It is found that the best bunches and best fruit are grown in January, February, and March, and this fruit when harvested four to five months hence will meet the best market, and the fruit can be allowed to remain until fully matured. There is no loss through ripening or boiling, and it will be found that it is approximately twelve months from planting to bunching time if planted at this time of the year. On southerly or cool situations it is preferable that all the planting should be done by the latter end of December. On eastern and warmer sites planting can be deferred until the middle or latter end of January. If planted at this time they will get the benefit of the wet season and be well established ere the winter arrives and will keep growing right through it, providing the situation is warm.

Keep the Plant Growing.

Immediately the planting is finished all weeds should be kept down and not allowed to seed, and the saucer around the stool retained. The plant should be kept growing and not have a check, as this is the most critical stage of its life. Where hard patches of soil are found they should be broken with a forked hoe and whenever hoeing, the ground must be hoed, and incidentally the weeds, and worked up as deeply as possible. If this is done each time, a deep mulch will be obtained that will retain all quick rains and danger of washing will be lessened. If the soil is inclined to set in spite of this, a good deep fork hoeing should be given in the winter time and the ground left in a rough state and worked down with subsequent chippings. As bananas are usually planted on hillsides amongst stumps, logs, and roots, horse work cannot be practised, and in any case it is undesirable as handwork will give better net results.

Suckering.

In September following the planting a number of suckers will have appeared around the parent. These must be thinned out according to distance apart of the stools mentioned before, and in the case of 6 ft. and 8 ft. plantings one good, deep, hard, cone-shaped sucker retained. If the eyes have been cut away from the parent before planting, and providing it was not large when planted, it will be found that the biggest sucker of the right type will be the one desired. One growing at the back or side is preferred, but if in the front only it can be left, but all subsequent baby suckers of this should be grown at the back as the plant will work too shallow. In the case of 9 ft. to 12 ft. apart, one sucker of the right type left on each side, all others scooped out deeply and never chopped off with a grubber or bar. When in turn these suckers grow, one sucker each should be left. It will be found that before the end of the year more suckers have sprung up. These should again be removed so as not to hinder the growth of these selected. This will occur repeatedly up till winter time, and it is important that there should be only the selected suckers growing. No pruning or suckering should be done in the winter time.

When to Cut.

When the bunch is thrown, a strong prop about 6 ft. long should be inserted in the base of a leaf conveniently situated and the other end pressed firmly into the ground to support the sucker and bunch, and when the flower shields dry and separate from the stem they can be pulled out and the bud cut off the bunch when it has grown away sufficiently from the last hand of bananas. If the bunch is not sheltered from the sun by its leaves it is desirable to break down the last leaf and put the bunch completely in the shade. By doing this the fruit will retain a soft green, all the bananas fill evenly, and be protected from the strong rays of the sun. The fruit should never be cut until it is matured, and that is when they attain a full round appearance, the judgment of which is quickly acquired. In hot weather for far distant markets the fruit must be cut before maturity. In this case the hands should be broken into too small clumps.

Careful Handling Necessary.

After the bunch is cut the leaves of the stalk should be removed leaving the stem standing, as the root system of this will be utilised by the baby sucker and the residue contents absorbed by it. This is particularly valuable in dry time, and wonderful growth of the sucker will be noticed. The bunch should be very carefully handled, in the case of one being carried—by one hand on the stalk end and the other on the flower end. In the case of two, a yoke can be utilised or carried hanging down at one side, but in any case never carried on the shoulder. Too great a stress cannot be put upon this as it is at this stage that the greatest cause of Blackend or ruptured stem is occasioned. The bunches should be put down carefully, preferably on their side on a thick heap of trash, and covered over with leaves to protect them from the sun.

Where it is possible the bunches should be conveyed to the shed per overhead wires, thus facilitating handling with a minimum of bruising, as the banana is the most delicate fruit grown, the slightest knock showing black after ripening. Where wires cannot be used a slide with well-padded sides and floor can be requisitioned. The bunches should be stood up and placed in firmly so there is no rocking. On arrival at the shed they should be stood up singly on bags to prevent damage to the bottom hand and never heaped one upon the other. If the bunches are allowed to remain over night they will toughen and there will be less staining after being cut off, but bananas will never sweat on the bunch. The hands should be cut off with a small piece of stem adhering so as they can be broken apart easily, and this should be done by a to and fro movement by the packer according to how the fruit lies on the hand. When the hands are cut from the bunch they can be graded as near as possible and placed concave downwards hand upon hand. The grower's packing shed should be floored and the walls built showing no cracks, yet having plenty of ventilation in the way of windows or shutters half way up the wall so as to allow a draught of air to be continually passing above the fruit, carrying away the carbon dioxide which emanates from them. This particularly applies to the summer season. The fruit so handled will be cool when placed in the cases.

Packing and Grading.

At the present time different markets are demanding a different way of packing bananas. It would be an advantage to everyone concerned if a standard pack was evolved and a case label or stencil showing the grade and number of bananas contained therein placed upon the case, as is the case of citrus, apples, &c., but whichever way they are placed in the case it should be done very carefully and tightly, and the grade true in length and circumference. The method which is proving itself on the Sydney market is the single pack, placed on their sides with the stem out, working from one end of the case to the other, reversing each row so that each layer is bound, and when the case is opened on its side for inspection the stem ends are pointing in alternate directions. This is an attractive pack with a big count and carrying well. For Melbourne the desired method is to start the bottom layer with two joined bananas one upon the other, packing very tightly, and subsequent layers in single hands of threes and fours placed concave downwards with singles to fill in where required. Fruit needed to fill in centre space should be stood on their ends after two layers are packed and outside rows built up around them. In both cases the fruit should be packed tightly and brought above the case a little to show just a fair bulge when nailed up. The nailing of the lids should be done by the aid of a clamp and bumped down.

It is most essential that growers pay the greatest attention to the grading of their fruit, and only that of extra choice and choice quality sent to the Southern markets. If the bunches are showing only a small percentage of choice grade it would pay the grower to put it on the closest market on the bunch.

When loading lorries or trucks place all cases on their side and not on ends.

Cultivation and Manuring.

After a period of time which is governed by seasons and environment, the banana plant works up very closely to the surface of the soil and becomes prone to the effects of adverse conditions which materially reflect themselves upon the quality and quantity of the fruit. It cannot be said that the soil has been depleted of all its plant food, or, in other words, "worked out" as the accumulation of humus in the form of leaves, bark, &c., from the original scrub or forest has been going on for centuries, but it seems a matter of cultivation and a short period of rest that is needed, together with the breaking up of the old plant and replanting to put matters right. We know that the arrowroot or any other bulbous plant will come almost out of the ground in a very short time, and that when the clumps are broken up and the ground well cultivated a second crop can be obtained almost as good as the preceding one. If the soil was well worked, planted with one of the leguminosae order of plants, such as the cowpea, &c., eventually turned under in a green state, and generally rested for twelve months, the results would be even better. Whichever way is adopted the holes should be dug in a different place than where the old stools stood, and, after planting, an application of about 5 cwt. per acre of a complete fertiliser spread on the surface about 3 to 4 ft. from the new plant and worked in lightly. A mixture containing for its component parts sulphate of potash, with sulphate of ammonia or nitrate of soda next and a phosphoric acid manure to complete it, is necessary. There are brands on the market containing these. When replanting allowance should be made for the slowness in the growth of the plant compared with the virgin crop and two months should suffice.

Manuring can be practised without replanting and if this is desired two applications of the same mixture as above should be given, say, 4 to 6 lb. per stool spread evenly all over the ground, and if the ground has been well cultivated previously, chipped in lightly, but the two operations of manuring and cultivation could be done simultaneously. The fertilising mixture given above is quick acting, and should not be applied to a dry soil, and only when the plant has ample moisture requirements. The best months to fertilise are August and December.

Thoroughness the Watchword.

Banana growing is very fascinating as the plants respond to good treatment, and is the means by which a conscientious man with small capital can make a start on the land without having to wait very long for a return; and as it is usually carried on in districts with a good and regular rainfall, risk from failure through bad seasons is reduced to a minimum. But planters must apply themselves intelligently, make "thorough" their watchword, and do the right thing at the right time all the time.

THE SUFFOLK SHEEP.

The extent to which public demand influences the products of the field is scarcely better illustrated than by the rise into popularity and fame of Suffolk sheep. This rise has taken place in the memory of those amongst us who are not very old. Until there was a marked demand for lean mutton the day of the Suffolk had not arrived, and although the breed has been in existence for at least from thirty to fifty years, what may be called the improved Suffolk is really the creation of little more than a decade.

Like the Oxford and Hampshire Downs, the Suffolk Down is essentially a made breed. Its constituent elements are the Southdown and the old Norfolk horned breed. Traces of its foundation parents are easily found even to-day in the rudimentary horns, which appear much more frequently than is desired, and the still more objectionable number of black staples which appear on the wool. When the breed was first represented at Kelso, Scotland, perhaps thirty years ago or less, the specimens presented gave no promise of the distinction to which the breed has now attained. They were condemned as "hard beggars" and "dour feeders." After the false start, for a good many years Suffolks were not seen at Kelso, and, as a matter of fact, it would have been difficult to give away a Suffolk ram in Scotland. As, however, the demand for lean mutton grew in intensity, and especially as the carcass competition at Smithfield gave the butchers the opportunity long desired of showing publicly what was needed to meet the public taste, the opportunity of the Suffolk-Cheviot crosses swept the boards in the carcass competitions, and to their lasting credit, be it said, the breeders of Suffolks rose to the occasion. The breed society sent right good specimens to the Kelso sales; Scottish farmers bought and tested, with the results which are now patent. Last year, at Kelso, the breed had two rings devoted exclusively to itself, and it shared a third with other breeds. The success achieved by Suffolk Down breeders in South Australia proves conclusively that the breed is destined sooner or later to enjoy wide popularity. Young flocks already in existence in that State have thrived well, and have given payable returns, while for crossing purposes they have given every satisfaction—"Stock and Station Journal," Melbourne.

THE FOOD VALUE OF DRIED WHEY SOLIDS.

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At many cheese factories there is difficulty in disposing of the whey. The great volume produced and the irregular output make it difficult to feed the whole of it to pigs in the immediate vicinity of the factories, and the bulk is so great in proportion to the solid contents that the stuff will not bear the cost of transport.

The solids, however, are rich in the constructive materials required for formation of bone and soft tissues in growing animals. Experiments carried out in America by McCollum have shown that the protein of whey is much more valuable for growth than that of grains. The salts, too, are specially suited to the requirements of young animals, since the different minerals are present in the proportion needed for growth, while in almost all other foodstuffs there is a deficiency of some and an excess of others. Milk sugar, the third chief constituent, is an easily assimilated carbohydrate which the stomach of the young animal is specially adapted to digest. Hence, though almost the whole of the fat and the most of the protein have been removed from the milk to make the cheese, the residue of the solid matter left in the whey has a very special food value, and it amounts to nearly half of what was originally present in the whole milk. The well known beneficial effects of feeding whey to young pigs can therefore be easily understood. It is the great bulk of water, amounting to nearly 94 per cent. of the total amount, that makes it difficult to utilise whey as a feeding-stuff.

At the factory established at Crewe by the Ministry of Agriculture whey solids and lactalbumen (the protein of whey) can be produced as dry powders. The following table gives an idea of the composition of these products:—

	Protein.	Fat.	Carbo- hydrate.	Mineral Matter.	Water.
Solids of Whey from which Fat has been-separated	12	1	69	8	10
Lactalbumen	76	2.5	7.5	3	11

These are concentrated food stuffs, easily handled. As there is a possibility of them being available as feeding-stuffs it was thought that it would be of interest to make practical tests to determine to what extent the nutritive value of milk is retained in these residues. Through the courtesy of the director of the Government factory at Crewe supplies of them were obtained, and the following experiments were carried out with young pigs at the time of weaning:—

Value of Milk Residues Compared with Whole Milk.

In this experiment a mixture of whey solids and lactalbumen was compared with whole milk. A litter of ten pigs, thirty-four days old, was divided into two groups of five each. They were allowed to continue sucking the sow, but three times a day the sow was driven off, and the two groups were separated out. One group was offered whole milk, and the other a mixture consisting of seventeen parts of separated whey solids to two of lactalbumen, the mixture being made up with water to the consistency of milk. The young pigs were allowed to drink as much as they wished, and account was kept of the amount eaten.

During the first week the pigs in the group receiving milk ate more greedily and put on more weight than those receiving the milk residues, but later those in the group receiving the milk residues ate as well and put on as much weight as those receiving whole milk. At the end of the twenty-eight days there was little difference in the weights, as is shown in the following table:—

	Average Weights at beginning.	Average Weights at end of 28 days period.	Total Gain.	Average Amount Eaten.
Whole Milk ..	20.2	38.7	18.7	Milk, 61 lb.
Milk Residues ..	20.9	38.7	17.8	{ Lactalb., 1½ lb. Whey solids, 8 lb.

* In "The Scottish Journal of Agriculture," Vol. VI., No. 1, January, 1923.

All the animals were in a thriving condition at the end of the experiment, when they were completely weaned and put on a mixture of maize, oatmeal, and fish meal on which they continued to thrive. During the first week after complete weaning, *i.e.*, in their tenth week after birth, the group that had been weaned on the milk residues put on, on an average, 1.16 lb. each per day, and the group that had been weaned on whole milk 1.19 lb.

During the twenty-eight days each animal getting the milk residues ate, on an average, 8 lb. of whey solids and 1.5 lb. of lactalbumen. As these contained about 10 per cent. of water, the total dry matter was about 8.6 lb. In the group getting whole milk each pig ate on an average 61 lb. of whole milk; that is, about 7.8 lb. of dry matter. Compared with the milk residues, therefore, the whole milk gave slightly greater gains for a slightly smaller quantity of dry matter eaten, which is what would be expected when it is remembered that the residues contain such a small proportion of fat compared with the solids of the whole milk.

Value of Whey Solids Compared with Skimmed Milk.

This experiment was devised to test the value of adding (1) whey solids and (2) skimmed milk to a ration consisting of equal parts of maize, oatmeal, and sharps. A litter of fifteen pigs was divided into five groups of three each. Three of the groups were used for this experiment, the other two being reserved for an experiment with other feeding-stuffs not connected with milk. The whole fifteen were allowed to suckle during the twenty-eight days of the experiment.

As before, the young pigs were separated from the sow and fed three times a day. One group received the meal mixture only, another a ration of equal parts of the meal mixture and whey solids, and a third a ration consisting of the meal mixture and whey solids, and a fourth ration consisting of the meal mixture and skimmed milk in the proportion of 3 lb. of the former to 28 lb. of the latter. There is about the same quantity of dry matter in 28 lb. of skimmed milk as in 3 lb. of whey solids, so that the rations with skimmed milk and whey solids were comparable as regards solids contents. The results are shown in the following table:—

		Average Gain in Weight.	Food Eaten per Animal.	
			Lb. Meals	Lb. Skimmed Milk
Skimmed Milk plus Meals	..	17.0	17.8	123.6
Whey Solids plus Meals	.. ..	15.4	11.7	Whey Solids 11.7
Meals only	.. .. .	10.8	Meals 22.5	

The beneficial effects of adding whey solids to meals are very apparent. An average gain in weight of 15.4 lb. was got in the animals which received 23.4 lb. of the half-and-half mixture of meals and whey solids, whereas only 10.8 lb. gain was obtained in the animal that ate on an average 22.5 lb. of meals. A comparison of the influence of the skimmed milk with the whey solids is not so clear. Those receiving the skimmed milk put on rather more weight, but they ate more food in proportion to the gains. As a whole, the experiment is a demonstration of the very special value of the constituents of milk for feeding young animals, and proves that whey solids as an addition to a meal ration enables much better utilisation to be made of the ration.

Other experiments were carried out to show the value of lactalbumen and the comparative value of whey solids and dried egg which is sometimes available as a feeding stuff. The results, which need not be detailed here, were, in general, the same as those recorded above. The addition of comparatively small amounts of these substances to a ration for young animals has a marked effect on the rate of growth.

Taken together, these experiments bring out clearly the special value of milk residues for growing animals. Milk is a fluid specially prepared by nature to yield constructive material for formation of bone and soft tissues. Whey solids contain nearly half of the solid material originally present in the milk. It is not surprising, therefore, that the addition of this material to the ration of young animals results in increased rate of growth.

The whey solids used in the experiments were obtained from whey from which the fat left after the cheese-making had been removed, so that only a small amount was left. In the solids from unseparated whey there is about five times as much fat as is

present in those from separated whey. No experiments were made with unseparated whey solids, but one would think that these being richer in fat would have given still better results.

Experiments with calves would be even more interesting than those with pigs. The milk of each species is specially adapted to the requirements of the young of that species. The ratios of the different tissue and bone-forming elements found in cow's milk are different from those found in sow's milk. One might expect, therefore, that whey from cow's milk would be more suitable for calves than for young pigs. Experiments to put this supposition to the practical test are in progress here.

The possibility of utilising whey solids for compounding a food for infants after weaning is worth while considering. The period between six and eighteen months of age is a critical one in the feeding of children. At this stage it is a common practice to begin giving foods made from cereal grains. These are deficient both in the quantity and in the quality of the proteins, and markedly deficient in the amounts and proportions of the various minerals necessary for health and growth. Milk added to these foods helps to correct the deficiencies, and to save the child from diseases of malnutrition, such as rickets. According to the results of the first experiments recorded here, dried whey solids should be almost as valuable as dried whole milk. The constituents most deficient in the solids are fat and the vitamin associated with fat. The deficiency of fat-soluble vitamin could easily be made good with the addition of small quantities of cod-liver oil. If whey solids were found to have the same excellent influence on the nutrition of infants as has been found in the experiment on growing pigs referred to here, the material is too valuable to be used as a feeding-stuff for farm stock. The whole of the whey output from cheese factories could be utilised for human food to the profit both of the factory and of the consumer. There is urgent need of a cheap food for children after weaning. The whole question of the availability and utilisation of whey solids for this purpose might well form the subject of a joint inquiry by the physiologist, the medical clinician, and the manager of the cheese factory.

According to Golding, of the National Dairy Institute, the production of whey in this country is estimated at 100,000,000 gallons, and of this one-half is wasted. At cheese factories the loss is as high as 75 per cent. It seems a pity that this valuable material, instead of being completely utilised, is allowed to run to waste to the pollution of the countryside. The writers have no data from which the cost of drying can be calculated, nor is it easy to estimate in money the worth of the dried material per pound. There is no doubt, however, but that the nutritive value of the dried material warrants a considerable expenditure on its preparation. If the Lactose Factory at Crewe can devise means of putting dried whey solids on the market at a reasonable price, it will have performed a valuable public service.

THE WHEAT CROP.

Wheatgrowers on the Downs took full advantage of the recent fine weather which with the bright sunshine and strong south-westerly winds proved ideal for harvesting. Machines were to be seen everywhere at work taking off the grain, a noticeable feature throughout being the efficiency of the harvesting machinery used.

In the case of over-ripe fields, particularly of "Florence" which sheds its grain rather readily, some loss was unavoidable, the "shattering" of the grain often accounting for two or three bushels per acre. Largely on this account a few growers started their machines some hours too early and this grain went into the bags a little on the soft side; however, as the weather was most favourable for the rapid drying of the grain in the standing crops it soon hardened, and as a matter of fact proved after a few days to be a little too brittle.

The concluding inspection of the Downs wheat areas embraced Clifton, Back Plains, Old Talgai, Pratten, Bony Mountain, Cunningham, Wheatvale, Freestone, Warwick, and the Killarney and Maryvale Valleys.

Experimental Plots.

The departmental wheat experiment plots at Allora and Freestone were harvested in the last week of November. Useful data were forthcoming respecting the behaviour of a large number of new varieties of wheat. At Freestone a series of fertiliser trials was carried out, but no difference was discernible between the crops grown on the special plots as a result of the use of the fertiliser. In the field variety trials between different varieties grown without a fertiliser of any kind on areas of approximately 3 acres each the departmental wheats generally gave satisfactory results, notwithstanding the effect of late frosts. It was shown as a result of the latter trials on

this particular farm that when these average wheat yields and those of the departmental wheats were compared, there was a difference in favour of the latter of nearly 10 bushels per acre.

The Fertility of the Downs.

It is generally conceded that the soils on which wheat is grown on the Downs are, if anything, rather too fertile for this crop, particularly in a season like the present. Evidence of this fertility was noticeable in every district visited. In this connection a "scrub" farm at Upper Freestone furnished a most remarkable result as a 42-bushel crop per acre of "Florence" wheat was harvested from land which had been cropped for upwards of thirty-five years and no fertiliser of any kind had ever been used.

A Bountiful Harvest.

Notwithstanding the influence of an abnormally wet season, of late frosts, and in some localities of a certain amount of rust, this year's wheat crop in the aggregate will be a most bountiful one. The earlier harvested grain generally left much to be desired on the score of quality, but the perfect harvesting weather experienced later effected a most pronounced improvement in the quality of the wheat.

The Darling Downs never looked better than they do to-day. The recent maize crop proved heavier than any previously raised. Had prices been at all satisfactory growers would have been compensated for a run of lean years. Lucerne crops are excellent everywhere, but the weather has been against hay-making, and many fields have perforce to remain untouched until the wheat, barley, and canary seed crops are harvested. This year's crop of oats suffered rather badly from rust.

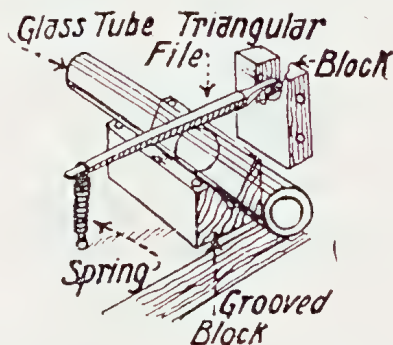
All classes of stock are in excellent condition, and dairy cows are producing well.

Natural grasses, which it was generally considered had suffered a very severe set-back during a run of indifferent seasons, have reappeared and taken the place of much weed growth, which, up till recently, had monopolised a good deal of space in the grazing paddocks.

The bountiful season, however, is responsible for an extraordinary development of noxious weeds, not the least of which is the variegated thistle. This pest if not checked at the outset will soon develop into a serious menace to cultivated land—H. C. QUODLING, Director of Agriculture.

CUTTING GLASS TUBING.

The illustration shows an excellent method of cutting glass tubing. A block of wood with a V-groove cut in it is attached to the bench; a triangular file is arranged across this, the tang of the file having an eye formed in it, which swings on a pin driven through another block attached to the bench, as shown. The other



end of the file is slipped through the end of a coil spring which is fastened to a screw eye driven into the bench, and draws the file downward against the tubing. The tubing is placed in the V-block, between the block and the file. Turning the tube will then cause the file to score the glass, after which a few light taps will break it cleanly.—"Popular Mechanics."

WASTE BANANAS AS PIG FOOD.

During recent visits to the banana-growing areas of the North Coast of this State, the Instructor in Fruit Packing and Marketing, Mr. Wm. Rowlands, has stressed upon growers the wisdom of marketing only the better grades of bananas and of strictly discarding all immature, bruised, damaged, or otherwise waste stocks.

The question of the most satisfactory means of disposing of this rejected fruit was referred to the Instructor in Pig Raising, Mr. E. J. Shelton, who reports that, provided waste bananas are fed in reasonable quantities and that they form only a part of the daily ration, they may be advantageously fed, particularly to breeding sows during the period in which they are carrying their young, and to mature boars. They may also be used during the fattening stages for bacon pigs; this more particularly in the case of ripe fruit. It would be an advantage to allow very green, immature fruit to ripen somewhat before feeding to pigs and to see that all fruit is fed from clean, roomy troughs, placed on wooden feeding platforms, or on areas of clean ground away from mud puddles or other sodden places. Cleanliness in the feeding of any class of food is of prime importance and waste fruit which may be dragged through the mud is no exception.

It should be noted, however, that waste fruit should form portion of the ration only. Breeding sows should also be allowed ample supplies of other green foods such as lucerne, and should have abundant scope to roam over good grass pasture.

If these suggestions are followed there will be no occasion for the banana grower to complain of heavy financial loss as a result of discarding the various grades of bananas referred to.

FRUIT FLY INVESTIGATIONS.

*Report of the Entomologist (Stanthorpe District), Mr. H. Jarvis, for
September and October, 1924.*

A.—FRUIT FLY.

Overwintering Experiments.

Periodical inspection, during the months of September and October, 1924, of the cages of maggot-infested fruit, placed in the field last autumn, has failed to date to reveal any fruit fly emergence.

The soil under two of these cages was put through a sieve and carefully examined for fruit fly puparia—living or dead; but none were met with under the cages so examined. It is quite possible that the wet condition of the soil, nearly all through the winter and spring months, would account for the disappearance (*e.g.*, by rotting) of any dead fruit fly puparia that might have been present.

It is, of course, too early this season to pronounce definitely on the question of the overwintering or otherwise of the Queensland fruit fly in the Stanthorpe district from field experiments, but it is extremely likely that negative results pertaining thereto will this season again be obtained. If this assumption prove to hold good, I think we can state as fairly conclusive that *C. tryoni* does not pass the winter months in the soil as a pupa in the Granite Belt.

Fruit Fly in Imported Fruit.

On 15th September information was received from the Instructor in Fruit Culture at Toowoomba, Mr. W. Leslie, that citrus fruit from the North Coast and South Coast districts was arriving at Toowoomba, and that this on examination was found to contain fruit fly maggots.

On 8th October several oranges were received in a sealed package from Inspector C. F. Williams, Warwick. These oranges were found to contain full-grown fruit fly maggots. This fruit was also from the North Coast district. The maggots and fruit were placed in the Insectary, and on 28th October, ten specimens of *C. tryoni* (the Queensland Fruit Fly) emerged therefrom. This happening emphasises the value of the inspection work being carried out at Warwick, by Inspector C. F. Williams, in its relation to Stanthorpe.

First Appearance of Adult Fruit Fly under Natural Conditions.

On 18th October Instructor W. Leslie reported fruit fly on the wing and ovipositing in lemons, at Rangeville, Toowoomba, and on the 19th October specimens were received from him in confirmation.

First Occurrence in the Granite Belt.

On 16th October Inspector E. Stephens reported fruit fly in numbers at Dalveen, and the trapping of specimens with "Harvey Lure."

On the 17th Mr. Stephens brought to this office twelve fruit flies which he had so trapped; and these flies, on examination, all proved to be examples of *C. tryoni*. Five female flies examined were found to contain varying numbers of eggs, many just ready to be laid—one specimen contained as many as 50 eggs, another one as few as 7. It is worthy of note that Mr. Stephens found that the wind, during the time that these flies were being trapped, was north-west.

On the 18th October, fruit flies were found at the Summit, and from then onwards to date, fruit fly captures were reported from various parts of the district, and finally at Ballandean on 25th October.

Fruit Fly Parasite (*Opius*).

On 16th October a visit was made to Mr. Townsend's property to examine the cage placed over fifty fruit fly puparia which were secured on 29th July in soil under the native fruiting tree, *Notelaea longifolia* Vent. (locally "Australian Olive"). No fruit flies had emerged, nor were any parasites discernible. On 16th October four fruit fly parasites (*Opius*, *Braconidae*) emerged in the Insectary, from pupae obtained under *Notelaea* trees (29th July, 1924), two more emerged on the 20th October, six on the 23rd October, and eighteen on the 29th October. No fruit flies have to date emerged from this material.

(Note.—The discovery—originally made by Mr. H. Jarvis on information furnished by Mr. Townsend—not only indicated that fruit flies under certain circumstances might overwinter in the Granite Belt in fruit; but also, too, the very important role served by the native plant *Notelaea* in furnishing a breeding ground for fruit fly *Opius* parasites—thus the wisdom of encouraging the local growth of *Notelaea longifolia* to the fullest extent. It further—in connection with the entomologist's earlier introduction of the *Opius* fruit fly parasite into the Stanthorpe area, as set forth in a previous report . . . , the wisdom of the expedient, elsewhere mentioned by us, of securing the establishment there of other plants—bearing too small fruits—especially non esculent ones, in which not only the first appearing fruit flies in each season might lay their eggs, but in which (owing to the smallness of these fruits) the resulting maggots might serve for the parasite's natural increase; and so for the destruction by it of fruit fly maggots later on, when merchantable fruit occurred in the orchards—in fact to take the place of the coffee plant elsewhere where the *Opius* is used in fruit fly control.—Henry Tryon, Entomologist in Chief.)

B.—CODLING MOTH.

Codling Moth—Seasonal Occurrence.

The first hatchings of codling moth this season in the Insectary were on the 16th October; many of these were from second-crop apples secured last May. Daily hatchings have taken place since that date. It is rather remarkable that codling moth larvæ, developing in "second crop" apples, should mature and emerge as moths so early in the season.

A Parasite.—A very interesting parasite of the codling moth was brought to my notice on 24th October by Inspector F. Becker, who then submitted three parasitised codling moth chrysalises. One parasite had already emerged, and another could easily be seen inside the chrysalis, on holding it to the light, and this has subsequently emerged also. The parasite is a very interesting chalcid wasp of stout build, the hind femur being very much swollen—as in species of the type-genus *Chalcis*. It is black in colour, and is about three-sixteenths of an inch in length. These parasites have been forwarded to the Entomologist-in-Chief for identification.

C.—WOOLLY APHIS.

Woolly Aphis Parasite, *Aphelinus mali*.

This useful parasite of the woolly aphis—formerly imported from New Zealand—is now successfully established in this district and a fairly large supply is available for local distribution. Every effort will be made to establish a colony of these parasites, in at least one orchard, in every centre throughout the district this season.

On 9th September two specimens of *Aphelinus mali* emerged in the Insectary from material obtained last autumn.

On the 11th September, fifteen specimens of this insect were seen by Inspector F. Becker and myself on the nursery-tree in the Stanthorpe area. The tree at this

time was just beginning to sprout, but had no leaves, yet the parasite seemed to be quite at home and busy among the woolly aphid colonies. Additional supplies of woolly aphids were secured and transferred to this tree, and the parasites were left to work until 8th October, on which date eight were collected by Mr. F. Becker and thereupon liberated at Severnlea. During the catching of these insects Mr. Becker made some very interesting observations on the parasites' method of oviposition. These observations are as follows:—

"The female *Aphelinus mali* approaches a colony of aphids and when close to them she turns round and backs into them. After first selecting one for oviposition, she scrapes the "wool" from its body by means of her strong hind legs (*i.e.*, last pair of legs); she then raises her abdomen, quickly stabs the aphid, at the same time inserting an egg in its body."

On the 13th October very large numbers of the parasite were observed on the tree crawling on the under surface of the leaves and amidst the colonies of woolly aphids, and it was thus realised that numbers could now be caught with safety for distribution elsewhere, as the parasite had evidently firmly established itself. Accordingly on the 22nd October, twenty-four parasites were secured and transferred to a tree at Dalveen, growing in the orchard of Mr. D. Stephens; this tree was screened from the wind and had on it a good supply of woolly aphids, and should make an ideal nursery for the parasite in the Dalveen district.

On the 27th October another twenty-four parasites were secured by Mr. Inspector Becker and taken to Ballandean, and liberated on a tree already prepared for them.

(Note.—I am indebted to the Chief Inspector, Mr. T. W. Lowry, for affording me occasionally the services of Inspector F. Becker for this work, and Mr. Becker has rendered me valuable assistance by his careful observation and quickness of eye and hand.)

Mr. Becker will have charge of the colony of *Aphelinus* at Ballandean, and should it become successfully established there, he will be able to distribute the parasites to orchardists who desire its introduction in the Ballandean *cum* Fletcher area.

D.—PEACH APHIS.

Black Aphid of the Peach.

These aphides (and also the green aphid species) have been exceedingly abundant this season; climatic conditions having evidently been favourable to their growth and development.

Both Black and Green Aphid have caused very considerable losses during recent months in relation to plum, peach, and nectarine trees. If neglected these pests will quickly destroy all chances of a fruit crop by seriously weakening the tree infested, and moreover causing all or nearly all of the young fruit to drop off.

Repeated sprayings with nicotine sulphate (Black Leaf 40) will keep these insects in check. The best results seem to be obtained by using soap as a spreader and giving one vigorous spraying, followed after a brief period (about three days) by another spraying. This procedure seems to be more effective than a succession of sprayings at intervals of ten or twelve days.

I am, again, indebted to Inspector F. Becker for bringing to my notice two parasites of the Black Aphid—one a Braconid wasp and the other a Chalcid fly. These have both been bred out in the Laboratory from material secured by Mr. Becker. I have not yet been successful in breeding *Aphelinus mali* from Black Peach Aphid, but I nevertheless consider that this little parasite may prove useful in checking this pest.

An experiment, to test the value of para-dichlorobenzol, as a soil-fumigant for Black Aphid on the roots of trees is now in progress. A small tin of this fumigant was recently received from Mr. W. Ranger, manager, Committee of Direction, Brisbane, and I am convinced that it will prove of great service for White Ants (Termites) in grape vine roots or in fruit trees; and perhaps for Woolly and Black Aphid on fruit-tree roots.

E.—SCALE INSECTS.

Scale Insect Predator.

On 16th September a useful insect was noticed at the Summit preying on Lecanium (berberidis). This insect—the larva or caterpillar of a small moth—completely devours the female scale insect, and finally turns to a chrysalis underneath the test or covering of the scale.

(Note.—Evidently a species of *Eublemma* (*Lep. Noctuidæ*) that under the name of *Thalpochares coccophaga* Meyr., was reported by us as controlling the Black Scale insect Lecanium. (*Saissetia oleæ*)—Insect and Fungus Pests. Brisb. 1889, pp. 18 and 126.—H.T.)

Inspector St. J. Pratt also brought to my notice a moth larva of similar habits, that he found in large numbers associated with San José Scale Insect, and completely destroying it too. So numerous were the small cocoons of this insect, on one branch submitted to me by Mr. Pratt, that they almost entirely covered it. I have not so far been able to obtain the moth or final stage of this insect.

F.—DESTRUCTIVE BEETLES.

Apple Beetle (*Orthorhinus cylindrirostris*).

This weevil, sometimes known as "Elephant Beetle" is responsible for a good deal of damage to the smaller branches of apple-trees. Inspector E. Stephens, Dalveen, submitted specimens both of this beetle and also of the damage occasioned by it to the apple wood. The beetle is about five-eighths of an inch in length (just over half an inch), it is pale brown in colour, and is clothed with short hairs. It is remarkable for having the front pair of legs much longer than the second and third pairs, and also for its long trunk or snout, from which latter feature it gets its popular name of "Elephant Beetle." Its habit in relation to the apple is to gnaw the bark from the smaller branches to the depth of about one-thirty-second of an inch, sometimes continuing this right round the branch, and so ringing it. It does not confine its attention to the bark alone, but also attacks the young fruit, operating in a similar manner.

I have specimens of this insect from Applethorpe, where also it is mainly associated with the apple as above; but it has also been found in the larval condition boring in grape vine wood; and the adult beetle was reared in the Insectary from the specimens obtained thus in this association. I do not consider, however, it is likely to prove a pest; as, in respect to the apple, it can be easily controlled; and as regards its presence in grape vines, the instance referred to is the only one afforded by this district on record.

Wood Boring Beetle (*Xyloborus solidus*).

This little wood-boring beetle has been recorded this season from various localities, and has been found "working" in plum, apricot, and apple-trees. Hitherto, I have only obtained records of its presence in apricot trees, but quite recently Inspector St. J. Pratt found it boring in plum trees, and Chief Inspector T. W. Lowry communicated its occurrence in apple-tree wood.

As I have before mentioned, in a previous report, this beetle is not responsible for the sickness of the tree on which it is found, for it only makes its appearance when a tree or branch is, from some cause or other, in a dying condition. Its presence in a branch can easily be detected by the small holes (about one-sixteenth inch in diameter) made by the beetles in entering or on emerging from the wood. The beetle is about a quarter inch in length, cylindrical in shape, and has the posterior portion of the body obliquely flattened, giving the insect somewhat the appearance of a small piece of stick pared abruptly off at one end.

G.—MISCELLANEOUS.

Plum Caterpillar.

A large noctuid caterpillar was found on 24th October, 1924, by Inspector T. Jardine attacking green plums in the Sugarloaf district, and doing a good deal of damage. The caterpillar is green in colour, and about two inches in length. An effort will be made to secure additional specimens from which the moth can be bred and so identified.

Fungus Diseases.

On 7th October the Government Entomologist and Plant Pathologist, Mr. H. Tryon, arrived in Stanthorpe to further investigate the occurrence of a serious "root disease" affecting apple trees. The following places were visited in his company:—The Summit, Applethorpe, Broadwater, Glen Aplin, Amiens, and Pozieres.

There are yet many serious and obscure fruit-tree troubles to be investigated here, and it is hoped, therefore, that the Government Pathologist will be able to pay a second visit of longer duration to the district.

Illustrations of various fungus troubles affecting fruit trees and grapes have been recently submitted to the Pathologist, and his reports on these diseases have been received and communicated to those in whose interests this was done.—H. Jarvis, 3rd November, 1924.

THE POULTRY TICK.

By P. RUMBALL, Poultry Instructor.

As the hot weather is here, poultry parasites will become more troublesome, the worst of which is the poultry tick. The tick already infests a large area of this State, and its further spread must be checked as a protection to the poultry industry. In town areas, the tick passes from one property to another by way of fences, boxes, old bags, and crates. A clean crate placed alongside an infested one, even for a night, is frequently the means of conveying the pest to clean districts. The purchase of new birds is also another channel by which this pest is transferred to other yards. I have even seen carts in the street infested with this parasite. Many excellent articles have been written on the subject, and it is not intended to go fully into the life and habits now. Briefly, the female tick lays eggs, sometimes on the bird, but more commonly in the cracks and crevices, to where they have retreated during the day. When the young is hatched, it has six legs, and is a light



PLATE 146.

Upper Left.—Larvæ of fowl tick under feathers of fowl.

Upper Right.—Unengorged male.

Lower Left.—Female with eggs.

Lower Right.—Unengorged female.

grey in colour. It attaches itself to the bird and remains there while feeding. When satisfied the tick leaves its host and retreats to some dark corner or crevice, where it digests its meal and sheds its skin. The newly moulted tick now has eight legs, and after a few days again attacks a host, feeds, seeks retreat, and again moults. This process is repeated until the tick is fully developed, and is sexually mature. Full-grown females are frequently the size of a finger nail. In searching for the tick insert into the crevice the blade of a pen knife, when their presence is revealed by blood on the blade or the dislodging of specimens. The presence of tick is also frequently indicated by the stains on the timber around their retreat. From the foregoing, it will be seen that during the day the adult tick is under cover principally

in the roosting quarters, cracks in the timber, nest boxes, old bags, or even between sheets of galvanised iron where it overlaps, and the young or seed tick is attached to the fowl. The effect of poultry tick on fowls is not confined to the loss of blood. The most serious effect of tick is caused by the transmission of an actual blood parasite. This parasite induces a fever which either causes the fowl to die or leaves it after a severe illness to recover and become immune to further attacks. This immunity frequently leads farmers to under-estimate the havoc that can be wrought by the poultry tick, and they become indifferent to their presence.

The symptoms of fowls suffering from tick fever are rise in temperature, listlessness, frequently a loss of appetite, restless and distressed, ruffled plumage, comb blackness and shrinkage, and some symptoms of paralysis. Diarrhoea is nearly always present, and owners frequently arrive at the conclusion that their birds are suffering from cholera. When these symptoms present themselves, a thorough search should be made for tick. Spraying and dipping are then a means of destroying these pests, but owing to the latter necessitating the catching and handling of the birds, it is not generally to be recommended, as anything of this nature is detrimental to egg production. The better method is to spray at intervals of, say, three days, until all the ticks are eradicated. Kerosene is the best and cheapest agent for the eradication of poultry tick. It is used in the form of an emulsion. Take 1 gallon of boiling water and dissolve in it 8 oz. of soft soap, remove from fire and stir in 1 gallon of kerosene; to this add 8 gallons of water and you then have a spray that will destroy ticks. It is imperative that soft water only be used in making this emulsion, otherwise the kerosene will separate from the water. All woodwork and crevices need to be done thoroughly, and it will be understood that any timber, wooden nest boxes, and harbour of such nature that are not necessary should be burnt. In the event of it being necessary to dip poultry, they could be dipped in the mixture, but care must be exercised to see that there is no free oil floating as it will scald the bird. A 2 per cent. formalin solution is recommended for dipping. It will be seen that the prevention of the spread of this pest, and also its eradication is in the hands of the producer. A farm free from tick may be kept so by the strict examination of all birds bought, and crates, egg boxes, &c., which are returned from market. It will also pay the farmer whose birds are infested to get to work and eradicate this pest; the cost is not great and the time involved would be amply repaid by additional returns.

PIG BREEDING.

ROOT CROPS FOR PIGS.

Pig foods of all descriptions have been very expensive for years past, and though quite recently in Queensland there has been an appreciable drop in the price of all concentrated feeding stuffs—pollard, barley meal, maize, wheat meal, &c.—and of other foods, the prospects of a continuance of low values for these foods and of regular supplies being available at these rates when required is not attractive enough nor is it desirable.

The secret of success in pig raising is the production of as much food as possible on the farms, consequently the subject of making suitable provision in the shape of quick-growing, heavy-yielding farm crops calls for careful consideration.

During a discussion recently upon the relative values and merits of artichokes and sweet potatoes as food for pigs, the question was asked as to whether an acre of artichokes would fatten more pigs than an acre of sweet potatoes. This is not an easy question to answer, for everything would depend upon the class of soil in which the crops were grown and upon climatic conditions, &c., as both crops are not equally suitable for all climates. Artichokes thrive in warm as well as in cold climates and give best results in a good mellow loam or on a soil in which the English potato flourishes, whilst the best crops of sweet potatoes are secured in the warmer sub-tropical climate where there is a more liberal rainfall and where the soil is light and of a sandy or loamy nature. In suitable soils an acre of sweet potatoes will provide more food than a similar area of artichokes.

For full details regarding the cultivation of the sweet potato, the most suitable varieties, &c., pig-breeders are referred to the pamphlet dealing with this subject issued by the Department of Agriculture and Stock, Brisbane.

There is this to be said in favour of sweet potatoes that the tops or vines may be fed to pigs, cows, or sheep, beneficially and safely, though there are some pig-breeders who aver that they have had pigs poisoned as a result of eating the vines of the sweet potato. The vines are in reality more nitrogenous (flesh forming) than

the tubers; and if the crop is fed off by the pigs being allowed to do their own harvesting they will benefit by eating both vines and tubers and in this way they would tend to balance their own ration, whereas if the vines were discarded in digging and the tubers only fed the same beneficial result would not accrue to either animal or owner. The contrast between the analyses of artichokes and sweet potatoes may be seen from the following table; that of the ordinary potato is given for comparison.

—	Water.	Carbo- hydrates.	Protein.	Fat.	Ash.	Nutritive ratio.
Artichokes (tubers) ..	79.5	16.7	2.5	0.2	1.0	1 to 7
Sweet Potatoes (tubers) ..	71.1	24.7	1.5	0.4	1.0	1 to 17
Potatoes (Ordinary English tubers)	78.9	17.9	2.1	0.1	1.0	1 to 8.6



PLATE 147.—JERUSALEM OR GLOBE ARTICHOKE YIELD AN ABUNDANT CROP OF SUCCULENT NUTRITIOUS TUBERS. MUCH APPRECIATED BY ALL CLASSES OF PIGS.

The artichoke is in general the cheapest crop to produce; less labour is required in planting, but from 4 cwt. to 5 cwt. of seed per acre is needed, whereas the sweet potato is propagated by means of cuttings and to produce these "shoots" or cuttings less than 1 cwt. of sweet potatoes would be necessary.

In favourable localities the sweet potato is the most profitable, especially as, if carefully handled, it can be dug and stored much more satisfactorily than artichokes.

In each case, and especially in that of the artichokes, it must be remembered that the plant may become a "weed" and be difficult to eradicate; these crops should, therefore, be grown only on spare ground that has been thoroughly cleansed and prepared beforehand and on land that is not required immediately for the general rotation of crops grown on the farm.

Artichokes occupy the land continuously for several years and continue to "crop up" long after the main crop has been "turned in." Neither crop can be considered a complete ration for fattening purposes; to secure the best results they should be supplemented with lucerne, barley, maize, peas, or other crops, or with some grain concentrate and with skim milk.

Further reference will be made in future notes to mangels, sugar beets, peanuts, &c., and to the cultivation of the different varieties of artichokes, &c.—E. J. SHELTON, H.D.A., Instructor in Pig Raising.

THE NATIVE BRYONY (*Bryonia laciniosa*)

A POISONOUS PLANT.

By C. T. WHITE, Government Botanist.

Description.—A rather slender climber of the melon family. Stems smooth or somewhat prickly, with a number of short, sharp, prickles. Leaves very deeply lobed, somewhat variable in size, mostly about 3 in. across, the lobes mostly about 3 in. long and $\frac{1}{2}$ to 1 in. broad, but often larger. Flowers small, borne in clusters in the axils of the leaves, the male and female flowers often in the same cluster. Berries, globular about 1 in. in diameter, bright red, marked lengthwise with a number of wavy white lines.

Distribution.—Very common in the coastal "scrubs" (rain-forests) of Queensland and Northern New South Wales; also found in tropical Asia and tropical Africa.

Botanical Name.—*Bryonia*, the Greek and Latin name for the European Bryony; *laciniosa*, from the Latin *lacinia*, the lappet or flap of a garment; referring to the leaves being lobed.

Poisonous Properties.—Dr. A. H. Baldwin, Acting Director of the Australian Institute of Tropical Medicine, Townsville, under date 3rd September, 1924, wrote me:—

"I am forwarding by the same mail a small package containing the stalk and part of two berries of a plant which is reputed to have caused the death of two children in North Queensland. Unfortunately, owing to the small amount of the plant forwarded to us I am unable to supply you with more for your examination, but should you desire it, I will endeavour to get a further supply. It appears to be somewhat like the Japanese cucumber. At this Institute an emulsion was made of the berries, one part of berries to six of water. Seven c.c.s. of this emulsion was administered to a full-size female guinea pig with the following results:—

"At 10.15 a.m. 7 c.c.s. of emulsion was administered by a stomach tube.

10.25 a.m.—Temperature 102 degrees F.

11.25 a.m.—Temperature 97.2.

12.20 p.m.—Temperature 96.0.

2.0 p.m.—Temperature 97.3.

"The guinea pig at the present stage appears liable to die. Through the course of our observations, it has suffered from laboured breathing, obvious discomfort, twitching of the nostrils, hair standing on end, and on occasions a coarse convulsive movement of the hind legs. It would appear from this that there is some toxic substance present in the berries. I should be very glad if you could name the plant for me and also inform me if it is known, if a toxic principle be present, and what this is?"

The plant forwarded by Dr. Baldwin proved to be the native Bryony (*Bryonia laciniosa*). The fruits of this plant had previously been accused in Australia of causing the death of children who had eaten them. In the "New South Wales Agricultural Gazette for July, 1896 (Vol. VII., p. 424) J. H. Maiden recorded the death of a child at Boggumbil, New South Wales, due to eating the poisonous red



I. W. Helmsing, Del.]

PLATE 148.—THE NATIVE BRYONY (*Bryonia laciniosa*).

and white berries of this vine. The vine is very common in the coastal "scrubs" or "bushes" almost throughout Queensland, and therefore a warning regarding the plant is not out of place. It can very easily be told by its small melon-like fruits, of a bright red colour marked with longitudinal white lines. Our plant is very closely allied to the common Bryony of Europe, which is well known as a poisonous plant. Cornevin (*Des Plantes Vénéneuses*) intimated that fifteen berries would cause the death of a child and forty that of an adult. The poisonous principle is the glucoside "bryonin." This principle is also probably in the Australian plant. Both the European and Australian species (which extends to tropical Asia) are used medicinally in spite of their poisonous properties.

Under date 26th September, 1924, Dr. Baldwin further wrote:—

"I was very pleased to receive your memorandum of 23rd September, giving particulars about *Bryonia laciniosa*. From further experiments which we carried out we have come to the conclusion that there was definitely a poison present, and that this was in the nature of a glucoside. A rabbit was fed with 6½ grams of a warm watery extract, and died within twenty-four hours after having exhibited intestinal and meningitic symptoms, the latter consisting of twitchings and convulsions. On post-mortem the most noticeable features were, a rather intense irritation of the small intestine about 2 ft. below the stomach with pronounced engorgement of the mesenteric vessels; the stomach itself was not much affected; the brain showed fairly severe engorgement, but not definite hæmorrhage. A guinea pig allowed to eat a few grams of the berries and provided with no water survived, but a guinea pig fed with a warm watery extract died on the third day."

The symptoms described by Dr. Baldwin agree more or less with those described for the European species (*B. dioica*); of this latter species H. C. Long in his "Plants Poisonous to Live Stock" says: "The symptoms are those resulting from inflammation of the stomach together with convulsions. According to Cornevin consumption of the plant promotes sweating and causes a livid hue, nausea, diuresis, and abundant painless watery defæcation, to which are added in cases of poisoning nervous symptoms or stupor and tetanic convulsions. There may be super-purgation or a suppression of defæcation."

INTERSTATE POTATO SHIPMENTS.

The Minister for Agriculture and Stock (Hon. W. N. Gillies) has made it clear that the Department has not been unmindful of the trouble due to the inability of growers and merchants to obtain new bags in which to ship potatoes to Sydney, in accordance with the regulation in force there. This regulation is consequent on a decision at the Agricultural Conference in 1921 to the effect that only new sacks are to be used for interstate trade. Though at that time it was a proper agreement to make, circumstances have altered, and there is a great shortage of new sacks, and in view of the present circumstances the Department has made a request that potatoes may be sent from here in clean, sound second-hand bags. This request was refused by the Department of Agriculture in New South Wales, and Mr. Gillies was so concerned about the obstacle to the interstate trade that he telegraphed personally to the Southern Minister asking him to reconsider his decision and permit the entry from Queensland of potatoes in clean and sound second-hand sacks, but without avail. This refusal is accentuated by the knowledge that, notwithstanding the agreement of 1921, Queensland has been permitting the entry of potatoes from New South Wales in second-hand sacks. There is, it is regretted, no reciprocation or co-operation on the part of New South Wales when there is a real reason for temporarily setting aside that agreement.

QUEENSLAND TREES.

By C. T. WHITE, F.L.S., Government Botanist, and W. D. FRANCIS, Assistant Botanist.

The pictures accompanying this article illustrate the lower part of the stem and flowering specimens of the Native Tamarind, *Diploglottis Cunninghamii*. This tree is a fairly conspicuous one on account of its very large, rusty, hairy leaves. The young shoots have a very dense, velvety coating of rust-coloured hairs. The yellow pulp of the fruit has a pleasant acid flavour, somewhat like that of the tamarind of commerce, and has been used for making a cordial. The ripe fruit is also sought after by pigs in the districts where the tree grows. The wood is pale yellow in colour and finely grained. The species has a fairly wide range in the coastal rain forests from Illawarra, New South Wales, to Cairns, North Queensland.



Photo. by A. H. Chisholm.]

PLATE 149.—THE NATIVE TAMARIND (*Diploglottis Cunninghamii*).—
A tree in the National Park, Roberts' Plateau.



Photo.: Dept. of Agric. and Stock.]

PLATE 150.

THE NATIVE TAMARIND; SHOWING LEAVES AND FLOWERS.

EGG-LAYING COMPETITIONS.

N.U.P.B.A., ZILLMERE.

3,856 eggs were laid at the N.U.P.B.A. Competition, Zillmere, in the course of October, the average per bird being: White Leghorns 22.4, Black Orpingtons 20.5, and Other Varieties 20.5, while the average for the whole competition was 21.7. One death occurred, a White Leghorn No. 81 owned by Mr. J. Purnell. The following have been affected by broodiness:—109, 112, 116, 126, 129, 136, 137, 145.

WHITE LEGHORNS.

Pen No.	Owner.	Oct.	Total.	Pen No.	Owner.	Oct.	Total.
104	Oakleigh P. F.	29	182	69	Kidd Bros.	23	98
21	Hodge, A.	27	161	62	Carinya P. F.	22	97
97	Sommerlad, K. A.	25	158	63	Carinya P. F.	23	97
20	Hodge, A.	25	156	5	Pember, H. T.	25	96
105	Oakleigh P. F.	22	156	59	Staib, A. (Replace,		
82	Wakefield, W.	25	154		13-6-24)	21	96
84	Wakefield, W.	24	153	26	Britten, H. T.	20	92
12	Berry, W. J.	29	149	34	Chapman, J. L.	27	92
95	Williams, G.	26	148	172	Grenier, S. L.	26	92
78	Newberry, M. F.	22	147	91	Hodgson, C. A.	25	89
19	Hodge, A.	21	146	83	Wakefield, W.	17	87
89	Duff, R.	26	146	107	Howard, W. L.	5	87
6	Pember, H. T.	24	145	17	Webster, J. T.	0	21
88	Duff, R.	26	145	50	Earl, J. (Replace,		
79	Purnell, J. E. G.	26	141		6-10-24)	21	21
90	Duff, R.	22	141	30	Campbell, M. H.	25	B148
76	Newberry, M. F.	18	138	71	Wilson, J. R.	27	B146
16	Webster, J. T.	24	137	67	Kidd Bros.	21	B143
101	Walters, A. S.	26	134	35	Chapman, J. L.	24	B140
11	Berry, W. J.	27	132	52	Rogers, G. E.	23	B135
25	Britten, H. T.	24	132	75	Raymond, E. C.	21	B134
48	Turner, R. C. J.	21	132	28	Campbell, M. H.	22	B132
41	Cole, R. C.	22	131	29	Campbell, M. H.	23	B132
64	Tracey, E.	23	131	14	Marks, G.	27	B130
73	Raymond, E. C.	24	131	42	Cole, R. C.	21	B128
92	Hodgson, C. A.	24	131	49	Earl, J.	23	B128
100	Walters, A. S.	24	131	72	Wilson, J. R.	23	B101
68	Kidd Bros.	21	130	33	Hindes, W. and G. W.	23	B98
174	Grenier, S. L.	25	128	77	Newberry, M. F.	17	B97
61	Carinya P. F.	23	127	24	Neil, A.	17	B84
65	Tracey, E.	27	125	173	Grenier, S. L.	21	B69
1	Williams, F. J.	23	124	7	Sturman, H.	11	B49
39	Fraser, H.	23	124	70	Wilson, J. R.	27	BE156
46	Turner, R. C. J.	18	124	55	Hutton, J.	26	BE154
51	Earl, J.	27	123	86	Enroh Pens	18	BE123
56	Hutton, J.	25	123	66	Tracey, E.	25	BE148
58	Staib, A.	22	123	31	Hindes, W. and G. W.	28	BE146
80	Purnell, J. E. G.	25	123	81	Purnell, J.	22	E142
15	Marks, G.	24	123	102	Walters, A. S.	26	E142
15	Marks, G.	24	122	54	Rogers, G. E.	24	E138
103	Oakleigh P. F.	6	122	18	Webster, J. T.	26	BE135
106	Howard, W. L.	25	122	27	Britten, H. T.	21	E133
40	Cole, R. C.	22	120	53	Rogers, G. E.	27	E133
99	Sommerlad, K. A.	24	120	32	Hindes, W. and G. W.	20	BE130
38	Fraser, H.	20	119	36	Chapman, J. L.	22	E122
60	Staib, A.	14	119	57	Hutton, J.	22	BE121
74	Raymond, E. C.	23	118	37	Fraser, H.	26	BE121
44	Adams, P. F.	21	114	9	Sturman, H.	25	BE118
108	Howard, W. L.	24	114	8	Sturman, H.	23	E115
87	Enroh Pens	23	113	2	Williams, F. J.	24	E113
93	Hodgson, C. A.	13	113	22	Neil, A.	16	BE110
45	Adams, P. F.	23	112	23	Neil, A.	20	BE110
98	Sommerlad, K. A.	23	111	96	Williams, G.	24	BE110
10	Berry, W. J.	25	110	3	Williams, F. J.	23	E109
47	Turner, R. C. J.	21	103	4	Pember, H. T.	22	E101
86	Enroh Pens	18	103				

B Signifies bird under standard weight.

E Signifies egg under standard weight.

BLACK ORPINGTONS.

Pen No.	Owner.	Oct.	Total.	Pen No.	Owner.	Oct.	Total.
127	Walters, E. ..	25	177	112	Wilson, W. R. ..	19	115
156	Hutton, J. ..	28	173	134	Dennis, C. C. ..	20	114
126	Brotherton, T. ..	15	170	152	Enroh Pens ..	26	110
130	Rogers, G. E. ..	22	166	137	Adams, W. S. ..	8	105
110	Fanning, T. ..	21	159	141	Prdy, J. (Replace, 7-7-24) ..	22	75
111	Fanning, T. ..	26	156	118	Chaille, H. M. ..	8	73
129	Walters, E. ..	20	156	121	Potter, J. ..	16	72
144	Cummings, F. P. ..	22	155	124	Brotherton, T. (Re- place 30-8-24) ..	22	49
131	Rogers, G. E. ..	25	152	119	Chaille, H. M. ..	25	B127
113	Wilson, W. R. ..	22	151	114	Wilson, W. R. ..	24	E177
143	Cummings, F. P. ..	22	151	142	Cummings, F. P. ..	27	E167
150	Raymond, E. C. ..	28	149	154	Hutton, J. ..	27	E162
116	Campbell, G. L. ..	14	148	138	Adams, W. S. ..	25	B161
139	Prdy, J. ..	23	148	115	Campbell, G. L. ..	5	E143
155	Hutton, J. ..	23	148	123	Potter, J. ..	22	E143
133	Dennis, C. C. ..	23	146	117	Campbell, G. L. ..	9	E140
120	Chaille, H. M. ..	23	134	140	Pryde, J. ..	28	E133
153	Enroh Pens ..	22	131	109	Fanning, T. ..	3	E130
125	Brotherton, T. ..	19	128	136	Adams, W. S. ..	17	E128
149	Raymond, E. C. ..	27	127	122	Potter, J. ..	18	E113
145	Everlay P. Y. ..	12	125	151	Enroh Pens ..	24	E109
128	Walters, E. ..	15	120	135	Dennis, C. C. ..	21	E94
146	Everlay P. Y. ..	23	120				
132	Rogers, G. E. ..	19	119				
148	Raymond, E. C. ..	20	117				

OTHER VARIETIES.

159	Messines P. F. (R.I.R.) ..	27	138	178	Ferguson, J., and Sons (B.L.) ..	26	97
169	Pryde, J. (Lang.) ..	15	131	164	Walters, A. S. (B.R.) ..	16	85
161	Ollier, T. C. (B.R.) ..	26	123	176	Everlay P. Y. (B.L.) ..	17	75
160	Ollier, T. C. (B.R.) ..	23	121	163	Walters, A. S. (B.R.) (Replace, 3-7-24) ..	18	68
168	Forsyth, W. H. (S.W.) ..	20	118	170	Pryde, J. (Lang.) Replace, 23-6-24) ..	20	B89
167	Forsyth, W. H. (S.W.) ..	17	114	175	Everlay P. Y. (B.L.) ..	27	E133
180	Ferguson, J., and Sons (B.L.) ..	19	114	162	Ollier, T. C. (B.R.) ..	17	E109
165	Walters, A. S. (B.R.) ..	21	110	171	Pryde, J. (Lang.) (Replace, 21-6-24) ..	19	E91
157	Messines P. F. (R.I.R.) ..	25	108	177	Everlay P. Y. (B.L.) ..	18	E79
158	Messines P. F. (R.I.R.) ..	14	108	179	Ferguson, J., and Sons (B.L.) ..	24	E78
166	Forsyth, W. H. (S.W.) ..	21	105				

B Signifies bird under standard weight.

E Signifies egg under standard weight.

C. KIDD, Hon. Secretary.

N.U.P.B.A. TOOWOOMBA SUB-BRANCH.

BLACK ORPINGTONS.

Pen No.	Owner.	Oct.	Total.	Pen No.	Owner.	Oct.	Total.
51	*Holmes, R. ..	26	164	28	†Williams, W. D. ..	23	153
9	†Everlay Poultry Farm ..	21	161	23	Carr, T. J. ..	21	152
41	Wilson, W. R. ..	28	159	7	†*Adams, P. F. ..	29	151
45	Stephens, H. B. ..	23	159	29	*Adams, W. S. ..	19	151
52	Holmes, R. ..	21	158	20	Maund, Mrs. L. ..	20	149
2	Hutton, J. ..	16	158	40	Rogers, G. E. ..	25	146
42	*Wilson, W. R. ..	24	157	10	Everlay, P. Farm ..	25	145
24	*Carr, T. J. ..	25	157	15	Macfarlane, K. ..	20	142
5	†Walters, E. ..	28	153	22	*Walsh, H. ..	22	142

* Signifies bird laying under-weight eggs.

† Signifies bird not true to type.

BLACK ORPINGTONS—*continued*.

Pen No.	Owner.	Oct.	Total.	Pen No.	Owner.	Oct.	Total.
50	†Ollier, T. C. . .	24	140	1	†Hutton, J. . .	13	117
39	†Rogers, G. E. . .	23	139	37	Short, J. W. . .	23	115
32	Radford, G. . .	20	138	21	Walsh, H. . .	15	114
25	Stephens, Moss . .	28	137	44	Smith, E. R. . .	17	112
19	Maund, Mrs. L. . .	23	134	14	Burns, R. . .	22	106
30	Adams, W. S. . .	27	134	8	Adams, P. F. . .	26	99
43	Smith, E. R. . .	17	133	47	*Head, J. . .	18	98
49	*Ollier, T. C. . .	12	132	34	*Potter, J. . .	15	97
33	Potter, J. . .	1	131	31	*Radford, G. . .	2	94
6	†Walters, E. . .	21	128	38	Short, J. W. . .	20	93
13	Burns, R. . .	23	128	4	McLay, J. A. . .	16	90
36	Rivett, R. R. . .	23	126	26	Stephens, Moss . .	18	88
3	McLay, J. A. . .	7	123	18	Champion S. H. K. . .	22	81
11	†Webb, A. W. . .	0	122	35	Rivett, R. R. . .	7	67
48	Head, J. . .	27	122	17	*Champion, S. H. K. . .	1	41
27	†Williams, W. D. . .	19	121	12	Webb, A. W. . .	0	16
16	*Macfarlane, K. . .	28	118	46	Stephens, H. B. . .	1	1

OTHER VARIETIES.

70	*†Dibbs, H. (Lang.) . .	31	173	71	Brand, V. (R.I.R.) . .	21	111
60	Le Pla, A. W. (R.I.R.)	26	170	54	Warrian, C. G. (Rock.)	20	109
53	†Warrian, C. G. (Rock.)	29	163	69	Dibbs, H. (Lang.) . .	17	106
66	*Becker, W. (Lang.) . .	25	155	72	Brand, V. (R.I.R.) . .	21	81
57	*Maund, Mrs. L. (Col. W'dotte)	25	148	63	Rafter, J. J. (B.L.) . .	20	80
65	*Becker, W. (Lang.) . .	25	140	55	Carr, T. J. (S.W.) . .	15	76
59	Le Pla, A. W. (R.I.R.)	4	133	58	Maund, Mrs. L. (Col. W'dotte)	16	73
61	Harrington, J. (B.L.)	20	128	67	Everlay P. F. (B.L.)	23	67
68	Everlay P. F. (B.L.)	22	123	62	*Harrington, J. (B.L.)	0	42
56	Carr, T. J. (S.W.) . .	14	121		(Bird dead)		
64	Rafter, J. J. (B.L.) . .	23	114				

WHITE LEGHORNS.

132	*†Short, J. W. . .	26	181	117	Goggins, J. . .	23	130
112	*†Chapman, S. . .	26	169	86	Rivett, R. R. . .	25	129
114	Cole, R. C. . .	23	167	87	Warrian, C. G. . .	23	128
131	*Short, J. W. . .	26	166	97	Hunt, G. . .	20	128
105	Hutton, J. . .	24	163	103	*Fallon, P. J. . .	17	128
73	Dippel, D. H. . .	26	157	116	Taylor, J. . .	25	128
124	King, J. E. . .	25	157	99	*Newton, J. W. . .	22	127
110	*Enroh Pens . .	26	155	108	Adams, W. S. . .	22	127
121	Grant, W. . .	26	154	77	Howard, R. B. . .	19	125
91	Stilton, G. . .	25	152	128	Stilton, E. J. . .	23	124
111	Chapman, S. . .	25	151	130	*Manning, H. G. . .	28	122
122	Grant, W. . .	26	151	76	†Wilson, W. . .	22	121
74	Dippel, D. H. . .	20	149	81	Smith, E. R. . .	23	119
123	King, J. E. . .	27	148	120	Rogers, G. E. . .	26	119
106	*Hutton, J. . .	21	147	80	McBean, S. . .	24	117
118	Goggins, J. . .	27	147	107	Adams, P. F. . .	23	117
129	Manning, H. G. . .	24	145	104	*Fallon, P. J. . .	21	116
113	Cole, R. C. . .	27	144	83	Carinya P. Farm . .	25	115
88	*Warrian, C. G. . .	28	143	90	Ellis, L. E. . .	25	115
93	†Williams, D. W. . .	22	141	126	Maurer, G. . .	25	115
115	Taylor, J. . .	26	140	79	*McBean, S. . .	24	114
100	*Newton, J. W. . .	22	137	102	Turner, R. C. J. . .	24	113
125	*Maurer, G. . .	26	137	92	Stilton, G. . .	22	110
78	Howard, R. B. . .	11	136	127	†Stilton, E. J. . .	20	110
109	*Enroh Pens . .	25	135	84	Carinya P. Farm . .	23	109
85	Rivett, R. R. . .	25	134	89	Ellis, L. E. . .	25	103
101	Turner, R. C. J. . .	21	133	119	Rogers, G. E. . .	22	103
96	Adams, W. S. . .	27	131	94	Williams, D. W. . .	22	101
75	Wilson, W. . .	21	130	98	Hunt, G. . .	21	85
95	Adams, W. S. . .	24	130	82	Smith, E. R. . .	25	82

* Signifies bird laying under-weight eggs.

† Signifies bird not true to type.

JOSEPH GARNER, Government Supervisor.

MOUNT GRAVATT.

During October 5,885 eggs were laid, being an average of 21.8 eggs per bird. Many of the scores in section 2 are affected by birds being broody. At the time of writing Mr. Hutton's "B" hen has made an unbroken sequence of 96 eggs. Two deaths occurred. Following are the individual scores. "U" opposite the scores indicates that the eggs are under the standard or 24 oz. to the dozen.

SECTION 1.

LIGHT BREEDS.

Name.	Breed.	A.	B.	C.	D.	E.	F.	Total for Month.	Grand Total.
W. and G. W. Hindes	White Leghorns	149	163	153	163	159	140	157	927 _U
W. H. Flowers	Do.	112	119	145	147	162	156	141	841 _U
H. Fraser	Do.	156	132	128	157	123	134	140	830
S. Grenier	Do.	122	127	155	136	129	140	149	821
Oakleigh P. Farm	Do.	117	154	125	127	146	147	122	816
John J. McLachlan	Do.	59	149	155	118	140	94	126	813
Mrs. L. Anderson	Do.	139	132	141	133	130	134	141	809 _U
R. C. J. Turner	Do.	145	148	120	139	103	154	154	809
T. H. Craig	Do.	130	139	134	148	100	153	149	804
H. T. Britten	Do.	153	151	88	128	68	127	122	793 _U
G. Marks	Do.	167	126	130	116	126	127	164	792
G. W. Cox	Do.	134	112	150	103	160	133	152	792
Mrs. R. E. Hodge	Do.	139	139	108	145	127	120	134	778
T. W. Honeywill	Do.	134	154	123	129	138	110	143	788
Kidd Bros.	Do.	145	149	98	143	124	129	136	788
J. E. G. Parnell	Do.	129	119	126	139	140	143	131	786
W. Wakefield	Do.	71	141	143	125	143	156	159	779
L. Bird	Do.	136	142	131	72	145	138	130	764 _U
A. Sterling	Anconas	116	122	145	132	105	125	111	745 _U
L. J. Silman	White Leghorns	141	135	127	111	120	99	138	735
W. D. Melrose	Do.	88	123	159	144	87	115	106	734 _U
A. Neil	Do.	144	138	128	135	61	120	124	726 _U
B. Driver	Do.	115	100	99	154	137	116	152	721
H. P. Clarke	Do.	110	102	121	134	120	104	135	689
T. W. Biddulph	Do.	150	136	80	125	92	104	115	687
W. D. McHardie	Anconas	121	112	98	119	119	117	136	686
J. W. Newton	White Leghorns	127	112	104	94	120	118	128	675
Chris. A. Goos	Do.	6	153	104	103	139	132	100	637 _U
George Williams	Do.	123	40	123	122	117	107	123	632
Ancona Club (pen 2)	Do.	107	103	69	74	104	92	102	549
Ancona Club (pen 1)	Do.	71	111	100	130	73	17	79	502

SECTION 2.

HEAVY BREEDS.

James Hutton	Black Orpingtons	153	184	159	131	138	147	147	912
James Potter	Do.	142	162	134	112	159	122	120	830 _U
Carinya Poultry Farm	Do.	121	99	146	133	136	146	131	781 _U
E. Walters	Do.	76	104	119	166	176	125	119	771
R. Burns	Do.	134	125	128	126	112	129	147	754
Mrs. A. E. Gallagher	Do.	110	149	115	120	124	122	151	740
Kidd Bros.	Do.	124	107	124	127	142	99	121	723
W. and G. W. Hindes	Do.	113	91	129	118	156	110	87	717 _U
H. G. Stephens	Do.	123	129	111	109	111	119	152	702
F. W. Lenny	Do.	133	90	144	91	91	133	130	682 _U
Mrs. A. Kent	Do.	133	152	74	96	83	117	121	655
H. M. Chaille	Do.	105	117	133	104	147	35	109	641 _U
J. Ferguson	Do.	52	99	125	118	112	127	115	633
E. C. Stodd	Wyandottes	61	129	83	109	83	94	136	559 _U

Following is the weight of eggs of each individual bird and the general average per dozen for each respective pen. These eggs were weighed in the presence of the honorary committee and to the nearest hundredth part of an ounce.

SECTION I.

Name.	A.	B.	C.	D.	E.	F.	Pen.
Mrs. R. E. Hodge ..	2.24	2.44	2.18	2.23	2.24	2.29	27.24
T. H. Craig ..	2.15	2.15	2.11	2.15	2.25	2.02	25.66
D. H. Flowers ..	1.94	2.13	2.06	2.01	1.75	2.05	23.88
T. W. Honeywill ..	2.29	2.00	2.27	2.17	2.05	2.13	25.82
J. E. G. Parnell ..	1.91	2.13	2.15	2.11	1.92	2.05	24.54
W. D. Melrose ..	1.87	2.0	1.96	2.09	1.59	2.13	23.28
Kidd Bros. ..	2.12	2.12	2.01	2.17	1.79	2.18	24.69
H. P. Clarke ..	2.10	2.01	2.16	2.18	2.07	2.29	25.62
G. Marks ..	1.92	2.25	2.03	2.12	2.08	2.07	24.94
Ancona (Club 1) ..	2.05	2.10	2.24	2.13	1.94	2.13	25.18
G. W. Cox ..	1.87	2.09	2.27	2.13	2.09	1.99	24.78
S. Grenier ..	2.01	1.96	2.17	2.14	1.99	2.29	25.12
D. and G. W. Hindes ..	1.80	1.95	1.85	1.90	2.05	1.97	23.04
J. W. Newton ..	2.12	1.94	2.15	2.10	2.09	1.94	24.68
Geo. Williams ..	2.17	..	2.05	2.36	2.24	1.99	25.92
Mrs. L. Anderson ..	2.18	2.07	1.91	1.89	1.76	1.97	23.56
L. J. Silman ..	2.14	2.10	2.06	2.02	2.0	2.19	25.01
Chris. A. Goos ..	..	2.09	1.75	1.92	1.91	2.12	23.52
Oakleigh Poultry Farm ..	2.18	2.01	1.98	2.03	2.01	1.97	24.36
John L. McLachlan ..	2.02	1.95	2.25	2.07	2.08	2.06	24.86
L. Bird ..	1.61	1.88	2.07	1.71	2.10	1.79	22.32
A. A. Stirling ..	1.97	1.88	1.86	2.05	2.12	1.92	23.60
W. D. McHardie ..	2.17	2.11	2.17	2.25	2.12	2.17	25.98
Ancona Club ..	1.99	1.90	2.27	1.96	2.27	1.92	24.62
H. Fraser ..	2.00	1.90	2.08	1.91	2.28	2.22	24.78
H. T. Britten ..	1.93	1.87	1.96	1.95	2.06	1.75	23.04
A. Neil ..	1.99	1.99	2.05	2.04	1.72	2.03	23.64
B. Driver ..	2.39	1.94	2.02	1.94	2.29	2.10	25.36
T. W. Biddulph ..	2.21	2.11	2.29	2.29	2.26	2.07	26.46
R. C. J. Turner ..	2.22	2.20	2.33	2.32	2.16	2.24	26.94
W. Wakefield ..	2.06	1.83	2.07	1.95	2.19	2.02	24.24

SECTION II.

Name.	A.	B.	C.	D.	E.	F.	Pen Average per Doz. Eggs.
E. C. Stead ..	1.94	1.93	1.88	1.86	1.81	1.82	22.48
Carinya Poultry Farm ..	1.87	2.00	2.12	1.98	1.92	1.98	23.74
Mrs. A. E. Gallagher ..	1.98	1.88	2.06	1.87	2.16	2.18	24.26
R. Burns ..	2.00	2.09	2.03	2.22	2.47	2.10	25.82
H. G. Stevens ..	1.97	2.28	2.03	2.01	2.15	2.03	24.94
J. Ferguson ..	2.41	2.23	2.54	1.97	2.04	2.26	26.9
Mrs. A. Kent ..	2.40	1.95	1.93	2.03	2.17	1.89	24.74
J. Potter ..	1.80	2.01	1.81	1.92	2.14	1.98	23.32
H. M. Chaille ..	1.93	2.18	1.90	1.83	1.99	1.99	23.64
E. Walters ..	2.07	1.99	2.02	2.13	1.85	2.20	24.52
W. and G. W. Hindes ..	1.75	1.90	1.98	1.97	2.04	1.75	22.78
James Hutton ..	2.16	2.14	2.24	2.08	2.22	2.29	26.26
Kidd Bros. ..	1.83	1.95	2.16	2.32	1.96	2.35	25.14
T. W. Lenny ..	1.82	2.32	2.17	1.63	1.98	1.75	23.34

From the foregoing figures it will be seen that there are 58 birds, or 31 per cent. in Section 1 which do not lay eggs of the standard weight, and in Section 2

41 birds, or 48 per cent. The 2-oz. egg is the universal standard adopted by Australian egg-laying tests and it would be very unwise to depart from this standard. If the results are analysed it will be seen that the average number of eggs from birds laying a standard egg is more than those laying undersized eggs, proving that it is not necessary to have a small egg in all cases to obtain the numbers.

The commercial value of the egg has also to be considered, as, on an average, there is about 2d. per dozen in favour of the first-grade egg. With an average in the test of 15 dozen eggs per bird, there will be a loss of £12 7s. 6d. due to undersized eggs. Apart from this loss, it is a well-known fact that in the flush season it is frequently difficult to dispose of undersized eggs, and if overseas marketing is to be a successful feature in the poultry industry, it is the 2-oz. egg that will assist to this end.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF OCTOBER, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING OCTOBER, 1924 AND 1923, FOR COMPARISON.

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	Oct.	No. of Years' Records.	Oct., 1924.	Oct., 1923.		Oct.	No. of Years' Records.	Oct., 1924.	Oct., 1923.
<i>North Coast.</i>					<i>South Coast—continued:</i>				
	In.		In.	In.		In.		In.	In.
Atherton	0·96	23	1·02	0·47	Nambour	2·98	28	5·24	1·13
Cairns	1·95	42	0·58	...	Nanango	2·27	42	7·01	1·39
Cardwell	2·04	52	1·19	...	Rockhampton ...	1·87	37	1·84	0·11
Cooktown	1·10	48	0·58	0·01	Woodford	2·54	37	5·54	0·91
Herberton	0·94	37	0·70	0·18					
Ingham	1·63	32	1·75	0·02	<i>Darling Downs.</i>				
Innisfail	2·97	43	0·86	...					
Mossman	3·00	15	0·62	...					
Townsville	1·27	53	3·09	...					
<i>Central Coast.</i>					Dalby	2·07	54	2·59	0·73
Ayr	0·99	37	3·00	0·02	Emu Vale	2·21	28	2·39	0·46
Bowen	1·04	53	3·96	...	Jimbour	1·85	36	4·10	1·64
Charters Towers ...	0·69	42	1·46	0·01	Miles	1·95	39	6·24	0·97
Mackay	1·84	53	0·42	0·10	Stanthorpe	2·58	51	4·37	1·14
Proserpine	1·72	21	5·58	...	Toowoomba	2·62	52	2·12	1·98
St. Lawrence	1·81	53	1·66	...	Warwick	2·33	59	2·38	1·71
<i>South Coast.</i>					<i>Maranoa.</i>				
					Roma	1·76	50	4·20	0·80
Biggenden	2·18	25	6·48	0·51	<i>State Farms, &c.</i>				
Bundaberg	2·06	41	1·75	0·34					
Brisbane	2·57	73	1·63	0·45	Bungewongorai ...	1·34	10	4·61	0·71
Childers	2·34	29	7·34	0·71	Gatton College ...	2·14	25	1·70	0·21
Cromahurst	3·61	30	6·34	0·93	Gindie	1·39	25	3·36	0·65
Esk	2·46	37	2·76	1·00	Hermitage	1·94	18	2·42	1·36
Gayndah	2·36	53	4·96	1·63	Kairi	1·19	10	...	0·36
Gympie	2·68	54	5·11	0·76	Sugar Experiment Station, Mackay	1·64	27	...	0·08
Glasshouse Mts. ...	2·63	16	...	0·16	Warren	2·16	10	3·48	0·06
Kilkivan	2·57	45	5·49	0·79					
Maryborough	2·66	53	4·27	0·92					

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for October, 1924, and for the same period of 1923, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND, State Meteorologist.

SWEET POTATOES.

CULTURAL NOTES.

Climate and Soil.

Sweet potatoes thrive best in tropical and sub-tropical localities, but can also be successfully grown in warm temperate districts. Soils most suitable are naturally well-drained, "free working," deep sandy loams, alluvials, and scrub soils, all containing a good supply of humus. Good crops may also be raised on moderately fertile sandy soils.

Where the soil is lacking in plant food and organic matter, well-rotted farmyard manure, supplemented with superphosphate and potash, should be turned in when cross-ploughing. Sweet potatoes should follow cowpeas in a rotation in preference to any gross feeding and strongly rooted crop like sorghum.

Preparation.

Soil preparation must commence some months prior to the planting season. At least two ploughings are required, the second the deeper of the two, say, up to 9 or 12 in., according to circumstances.

Subsequent cultivation to conserve soil moisture, kill weeds, and improve tilth should not exceed 4 in.

Raising the Crop.

Early planting—by means of "shoots" raised direct from tubers—is conducive to heavy yields. For this purpose, sound matured tubers of reputable quality, and of highly productive cropping capacity, should be selected; and the young plants or "shoots" grown according to directions.

A succession of these "shoots" is required for early mid-season planting. Later requirements in this direction are ordinarily obtainable from cuttings (10 to 12 in. long) of growing vines.

Planting.

In localities where frost is not prevalent, planting may commence in August and be carried on, according to circumstances, right into January.

One of two methods is customarily adopted:—

The first is to deeply dibble in "shoots" or cuttings 2 ft. apart along lines marked out 3 ft. apart for the purpose, and compressing the soil firmly with a spade against each shoot as it is planted.

The second is to lay the "shoots" down on the right-hand side of every fourth furrow and cover with the plough to within an 1 in. or 2 in. of the terminal bud, or, as an alternative, use a double-breasted plough for opening drills for planting and covering similarly.

Firming of the shoot in the soil is accomplished by the planter's boot when following up the ploughman, or by promptly rolling the surface of the ground.

Cultivation of Crop.

Start the cultivator as soon as the young plants show signs of having "taken," and continue the cultivation of the crop at intervals of about every week or ten days, gradually working the earth up well round the base of each plant until "hilled."

Five or six cultivations should be given. If a fall of rain occurs during the early growth of the crop, set the cultivator going as soon as conditions permit.

Ripeness of Tubers.

To ascertain whether tubers have reached maturity, cut or break the surface of one. If mature, a white crust will form on the exposed part, due to the crystallisation of the latex or milk-like juice of the tuber. When immature, the exposed surface rapidly becomes black.

Harvesting.

Tubers should be harvested during dry weather; and, to facilitate the operation, the vines should be cut, using either a scythe or sickle for the purpose. The tubers are subsequently lifted, either with the digging-fork or plough, and, when thoroughly dry, carted to the store or barn.

Storing.

When it is required to keep tubers for any length of time, select a well-drained, dry situation under a shed or barn. Put down a layer of dry sand, and place thereon a layer of tubers, care being taken to see that nothing but sound tubers are used, all those showing signs of damage by cuts or breakage being discarded. Spread sand over the layer, and fill up all interstices. Repeat the process *ad lib.*, and afterwards cover over with a thick covering of straw or bush hay.

HOW TO MAKE A PIG NET.

The method of making a pig net such as is illustrated herewith is extremely simple, and I have known persons to learn it in five minutes (writes Mr. W. J. Sheehan in the "Weekly Times"). All that is required is the rope and a piece of softwood or hardwood board, 12 or 18 in. long, rounded at the edges and the same width at both ends. This board is called the mesh stick, and is used to keep all the meshes the same size. A mesh stick 2 in. wide will make a 4-in. mesh; the rule is to have a stick half the width of the determined mesh. To measure the width of the meshes, pull them out to a diamond shape. The size of the mesh is left to the judgment of the person making the net. Instead of using a needle as the fisherman do, the rope may be rolled up in the same way as the ordinary clothes line. It can then be passed through the loops when making the knots easily and rapidly.

At one end of the rope to be used for making the net, tie a loop (A, Fig. 1), and place the knot on a strong spike or hook, attached to a post or wall or other convenient place, as at A, Fig. 2. Place the mesh stick or piece of board under the loop as at B, put the rope around the mesh stick, then pass the rope through the loop and pull the rope tight. Now, place the thumb of the left hand on the rope beyond the loop, at at A, Fig. 3, and with a turn of the wrist of the right hand, throw the rope to the position shown at B. Next, pass the rope behind the loop C, and then through the bight of B and down as at D; draw tight the knot, which should assume the shape indicated in Fig. 4. This figure shows the knot made loosely to enable the method of making it to be seen and easily understood. The rope must be held firmly with the thumb at A, Fig. 3, when pulling up the knot, as on this depends the uniformity of the meshes. To continue the netting, the stick is withdrawn and placed under A, Fig. 4. The rope is then passed around the stick, as in Fig. 2, and brought through the loop A, Fig. 4, and the process shown by Fig. 3 is repeated to form another mesh, this being continued to make a chain of meshes, say, the width of the farm dray or wagon in which the pigs are to be conveyed.

The loop A, Figs. 1, 2, and 5, first tied, is then untied, and it will be found that all the meshes are equal in size. Next, the chain of meshes is opened out at right angles to the line in which it was made, as shown in Fig. 6. In other words, remove the chain of meshes from a vertical position as in Fig. 5 and place them in a horizontal position as in Fig. 6. A line is run through the meshes D, E, F, G, and secured between two posts to hold the net while continuing the meshing.

Working across is then begun by making a mesh at A, Fig. 6, then at B, C, and so on, until the length of the first lot of meshes has been reached, when the right-hand side of the net is turned around and placed where the left-hand side was, and the left-hand side placed where the right-hand side was. Another row of meshes is started on the left-hand side (facing the net), and worked until the one under A has been reached on the right-hand side.

The net is then turned again, and another row of meshes commenced on the left-hand side, and so on until there are enough rows of meshes to cover the dray.

To secure the net to the vehicle, use rope plough reins, and reeve them through each mesh and around the side and end rails of the dray. The methods described above of making the meshes is the same as is used in making ordinary hammocks.

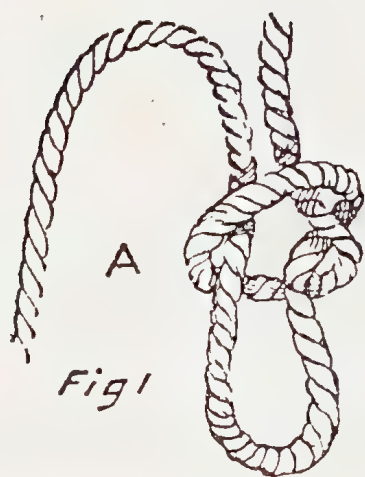


Fig 1

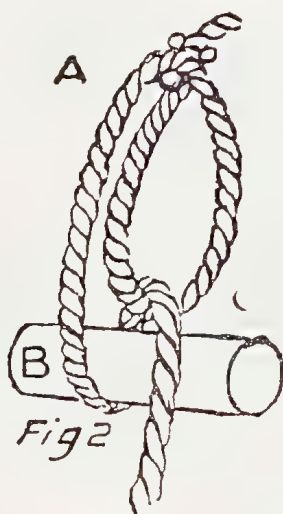


Fig 2

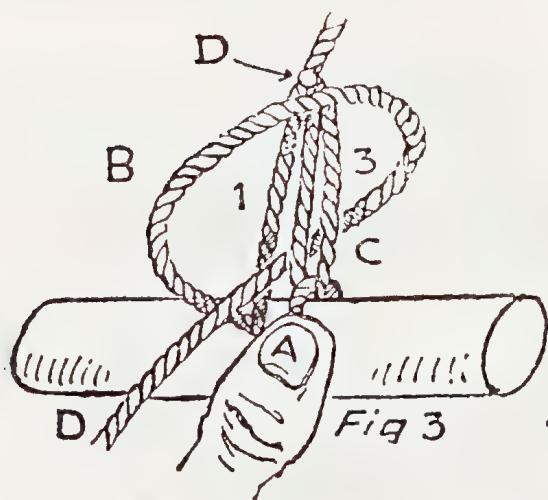


Fig 3

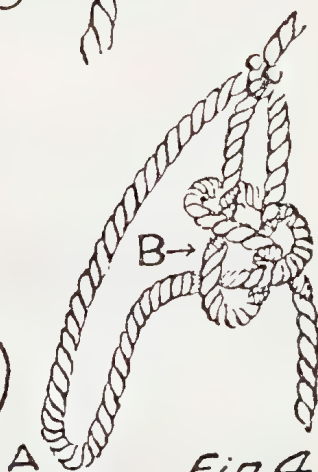


Fig 4



Fig 5

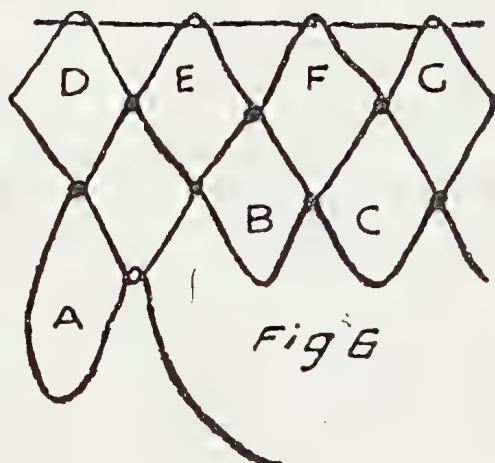


Fig 6

RURAL HYGIENE.

By W. H. READ, M.B., Ch.M. (Syd.), D.P.H. (Camb.).*

When we think of the wealth which comes to Australia from our wool and wheat, cattle and timber lands, and then ponder the isolation, heat, dust, and lack of ordinary comforts which settlers in the out-back put up with to help gather in our primary products, it must be admitted that we are under a great debt to these people, and it is up to us to help make their lot a healthier and a happier one.

City's Care.

In the city, in most matters of hygiene, others do the thinking for us. We have our health medical officers, our trained sanitary inspectors, our health societies—an evergrowing group of officials, investigators, and workmen collectively known as the sanitary authorities. These men are constantly at work and it is chiefly due to their labours that great epidemics are prevented. When their work is successful, nothing amiss happens, and the average citizen is unconscious of the fact that his health and perhaps his life have been in jeopardy.

When they fail, illness and death settle upon the community. Quick to seize upon every new fact in science, and calling to their assistance the best brains among doctors and engineers, these men have formulated a code of regulations for the preservation of the public health, the evasion of which is regarded as a criminal action for which the culprit is held responsible.

Country is Different.

In the country, at the present time, every person or family must of necessity, from a hygienic point of view, be a law unto himself or themselves. They, of course, enjoy one privilege, that is the advantage of dilution of population, so important a factor in the prevention of the spread of communicable disease. At the same time their very isolation prevents them from enjoying the advantage of such general utilities as the installation of a good public water supply, a complete and effective sewage system, an organised scavenging system, electric lighting, and other sanitary measures which are possible in an urban community.

The prevalent opinion is that a farm is a healthy place to live on, and so it should be. As an actual fact, however, owing to neglect of simple common sense, inexpensive and elementary observances of sanitation, persons living on farms are exposed to conditions dangerous to health to a greater extent than people living in a city. Thus the risk of typhoid fever in a modern city with a good water supply and modern water carriage system of sewage disposal is infinitely less than that on the average farm.

His work in the open-air and natural mode of life make the rural dweller one of the longest lived of the classes into which the community is divided, but in many cases his chances of long life are much reduced by inattention to the sanitary condition of his home and surroundings.

In a way he is not to be blamed—he is unfamiliar with such matters—he is fairly scared of the word “hygiene,” and how often does the unknown, when unexplained, strike terror to the human soul?

Ancient and Modern.

To the ancients, the unexplored ocean beyond those horizons they were accustomed to see, was filled with chimerical monsters and verged upon a terrible abyss into which too venturesome ships must fall. We have learned that the earth is a sphere, the seas have been explored, the abyss has disappeared, the terrors have been dissipated. Though occasional accidents befall they are recognised to be the results of natural causes and no mariner now fears to navigate the globe.

To many primitive peoples the mountains were the abode of the gods, or were haunted by evil spirits and were taboo; civilised man having ascended nearly all of their highest ranges has found them to be but irregularities of the earth's surface. Upon them accidents occasionally happen, but always from natural causes, and no one hesitates to climb.

So it is with the average country dweller and his conception of hygiene. His occupation takes up so much of his time that he has seldom leisure to consider the importance of healthy conditions necessary for human beings. Once he has properly

* From a lecture delivered on behalf of the Public Health Association of Australasia, before the Cumberland Branch of the Country Women's Association.

grasped the elementary principles of sanitation, he will be convinced that their practical application is a proposition that will pay, and that what was good enough for his father is not necessarily good enough for him.

What are these elementary principles and how can the farmer be taught them?

It would be impossible in a cursory paper like this to discuss these important matters in any detail. It is proposed therefore to do little more than touch upon a few of the things that a farmer should know about, and first as to the construction of his home.

There is a very definite relation existing between the manner of construction of the house and the health of its inmates. Health is more readily preserved in a house situated in the country surrounded by an unoccupied open space, than in one placed in a town surrounded by occupied houses, the smoke of whose chimneys taints the air, while the earth becomes impregnated with the accumulated filth of many a generation.

The rural dweller is certainly fortunate in escaping one of the greatest curses of urbanisation, that everlasting black pall of smoke which overhangs our cities and industrial areas and deprives us of a big percentage of available sunlight.

Health is affected by the soil on which the house stands, and by its immediate surroundings of hill and vegetation.

The wise man who we are told built his house upon the rock was only considering its stability; but we, in our generation have to think of the effect on health of the soil on which the house is erected as well as to consider how long the house will last.

Most Satisfactory Site.

As a general rule the most satisfactory site for a house is a moderately elevated one protected from westerly winds and having a good exposure to the sun from the other three points of the compass. It is desirable, if possible, that the direct rays of the sun should come into each room for some part of the day. There is no better disinfectant than bright sunlight, and we all know the stuffy smell of a room which has been shut up and kept dark for some time.

High-lying ground gives the advantage of free movement of air, and consequent freshness—in deep hollows the air stagnates. The surface of the ground should have a reasonable slope for drainage, and the soil and subsoil should be of a porous nature to prevent the stagnation of water on the surface or immediately below.

Certain subsoils, such as rocks or gravel, allow water to soak through easily, and thus quickly become dry after rain; others, like clay, prevent this percolation, and retain the water on their surface, being consequently damp soils.

A pervious soil is to be preferred to one which is impervious, gravel is thus more healthy than clay. There may be a thin layer of some permeable soil covering clay or other impermeable subsoil; the water does not then remain visible but is yet retained near the surface and renders the ground damp.

Concrete.

If there is no choice and the site is a damp one, the subsoil must be drained by suitable earthenware pipes which should be kept separate from the drains for waste waters, and the surface of the site should be covered with an impervious layer of concrete which should extend beyond the limits of the house itself.

Indeed, in a country like this, where so much damage is done by white ants, it is a question whether it would not be economical to have this concreting of the site done with every habitation. Where a hollow has been filled in with rubbish it is unfit for building upon until sufficient time has elapsed for all organic matter to be thoroughly destroyed, otherwise the gases of putrefaction may rise into the house and render it unhealthy.

Ventilation.

If the house is built of bricks it must be remembered that these will absorb moisture from the soil unless a damp-proof course is inserted in the brickwork above the ground level. The plates and joists which support the floor should be fixed above this damp-proof course, otherwise the moisture will reach the woodwork.

Since we know that the mortality from contagious diseases increases in proportion to the number of inmates of the rooms, hygiene requires that even the most modest dwellings should afford sufficient room to prevent over-crowding, and there should always be adequate provision for free ventilation.

Kitchen.

The kitchen is a place which should never be forgotten. Where it can be thoroughly separated from the rest of the dwelling this should be done; but under any circumstances the free ventilation of the space intervening between the two should be effected. This prevents the smell of cooking from pervading the whole dwelling, and also stops overheating of the rest of the house.

Every precaution should be taken to prevent the access of flies to the kitchen and pantry. Fly-proof doors and windows should be provided, and fly-papers to deal with any flies that may gain an entrance in spite of the precaution taken to exclude them.

Beware of the Fly.

The filthy but festive fly has a splendid scope for its activities in most rural homes. It plays such an important part in the country home that it may be of advantage to digress for a moment and give a short account of its life history. The female house fly, during her life of five to seven weeks, lays about 500 eggs. These are deposited in moist fermentable material—horse manure, human faeces, or ordinary refuse. They hatch out within 24 hours, into small white maggots, which crawl about and feed near the surface of the heap.

These maggots are full-grown in two to eight days, when they go into a pupal stage, looking like little, brown, seed-like bodies. In this stage they undergo a further transformation, and in two to eight days the young fly emerges. This dangerous insect has the disgusting habit of first frequenting the privy and then at the ringing of the dinner bell coming to the table without taking the trouble to wipe its feet.

It comes soiled with all the micro organisms that have been picked up in the course of its unsavoury peregrinations, among which may be those of typhoid fever, paratyphoid fever and dysentery. These it does not hesitate to scatter over the sponge-cake and preserves, which strongly attract it, and thus it may happen that with his desert the poor farmer unexpectedly swallows a dose of virulent poison. He must learn not to expose articles of food in such a manner that flies can soil them—he must learn not to tolerate flies in his kitchen or dining room.

Milk.

It should be remembered that many diseases are carried by milk, and, seeing that it is the chief source of nourishment for young children and the most delicate of all foods, every precaution should be taken to prevent its contamination.

It is fitting that this matter of milk should be mentioned in this connection because the dairyman is a rural worker, and because there is probably no article of food that is produced under filthier conditions than is milk. The dairyman must be taught what true surgical cleanliness is and he must learn to practise it.

It is not only the dairyman but also every householder who must try to check the growth of germs in milk and prevent the introduction of more. Clean vessels must always be used for its storage; if rusty or chipped vessels are used it is impossible to clean the germs from them, the result is that the milk will go sour.

It should be stored in a cool, shady place, because souring germs will not grow in cold milk. The vessels should be kept covered to prevent the access of flies which are one of the readiest means of spreading disease. The milk-can should be rinsed in cold water before washing, if hot water is used it will set a film of milk on the sides.

In washing the can use warm water and soda, this is the only safe way to properly clean it from all grease and dirt. Subsequent scalding with boiling water will kill all disease germs. After scalding, the can should not be dried with a cloth because this will introduce germs and undo the good of the scalding.

Keep Milk Cold.

As germs will not grow in cold milk, keep it as cold as possible; failing an ice chest, a simple cooler can be made from a kerosene tin in the following way:—

Cut out the four sides, leaving the angle corners as pillars, obtain 2½ yards of towelling 18 inches wide, and run a draw-string along one edge—wring out the towelling in cold water and put it around the tin; using the string to draw it into position on top. Place a basin on top full of water, and hang strips of towelling from this to the sides of the cooler in order to keep the sides wet. Hang the cooler in the open in a shady and draughty place.

It is a safe rule always to pasteurise the milk, even when it comes from your own cows, unless they have been tested and proved to be free from tuberculosis. Stand the vessel containing the milk in a saucepan with water as high as the milk, bring the milk to the boil and immediately take it off the fire and stand in running water to cool it. Then put it in the ice-chest or cool box, but not in a closed cupboard.

FLUSHING THE BREEDING SOW.

In perusing the pages of several of the older established text-books on "Animal Husbandry" one frequently comes across the term "flushing" as applied to "flushing the mare" or the ewe or the sow or cow or as the case may be, in each instance prior to the time the female is mated.

This "flushing" is not a common term in Australian live stock literature nor is it a regular practice on our farms, consequently an explanation of the term "flushing the sow" before mating will be of interest to readers of this Journal.

The term flushing simply means a general stimulation of the whole of the internal organisation of the animal, the object being to increase the number of pigs produced at farrowing time. The purpose is accomplished by increased feeding of grain or by the use of fresh or more succulent pastures than have previously been available.

The practice is understood and practised more by the sheep man than by the breeder of pigs or of most of the other classes of live stock; still it is a well recognised old time as well as modern practice. The sheep man follows it by turning the breeding ewes into a fresh succulent pasture just prior to "joining the rams," the time when the ewes are to be mated, the objective here being to secure a larger percentage of twins or a higher general average at lambing time.

There is no reason why the pig breeder should not adopt the same practice with his breeding sows, especially with sows that are advancing in age and that might otherwise produce rather unsatisfactory litters.

The most beneficial results are obtained when the flushing begins two or three weeks before the breeding season opens. Supposing that the sows have been running on pasture alone during the greater part of the "off" season; at the beginning of the breeding season or when the sows are about to be mated they should be turned into a fresh patch of rape, lucerne, or other green stuff that would furnish an abundance of the most succulent forage.

In the case of a single sow, the breeder might begin by feeding a slop composed of milk and pollard or wheat or maize meal, &c., and give more than the usual supply of green food. The idea is to stimulate the whole system without putting on any great amount of fat. It is, of course, expected that the animals will begin to gain a little more rapidly in early spring or as the breeding season opens, and the majority of breeders will see to it that their stock put on flesh at this time, but it is important that the sows should be in the medium breeding condition and be gaining in weight and flesh at the time when they are mated. After the sow has been mated, continue the practice for a week or two before turning her out to pasture again.

All sows should, of course, be kept in good breeding condition during the gestation period, but there is no necessity that they should be "rolling" in fat.—E. J. SHELTON, Instructor in Pig Raising.

Thirty-seven per cent. of the world's supply of pork (not including China) is produced in the United States. Australasia supplies only a negligible amount.

Our grandfathers would turn over in their graves if they heard of the methods followed in forcing and fattening pigs nowadays. Let the hog harvest his own corn; this is the modern method.

Be sure when you ear-tag your pigs not to clamp the tag so tight that it will stop the circulation of blood. It is painful, and sometimes the tag will make the ear decay and the tag will drop out and be lost.

GRADE STANDARDS FOR TOMATOES.

The Minister for Agriculture (Hon. W. N. Gillies) has announced that grade standards for tomatoes have been gazetted which provide for three grades—namely, “A,” “B,” and “C,” and applies to the whole of Queensland:—

“A” grade shall consist of sound, clean, well-formed, mature fruit, free from cat-face and other blemish, and not sunburnt.

“B” grade shall consist of sound, clean, mature fruit and contain not more than 25 per cent. of blemished fruit, and not sunburnt.

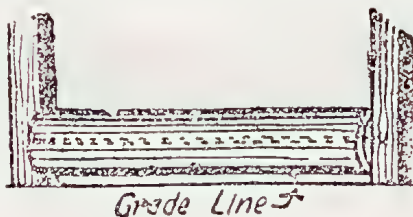
“C” grade shall consist of sound, clean, mature fruit, and contain more than 25 per cent of fruit affected with cat-face or other blemish and not sunburnt.

It has been decided to enforce these standards, and growers are therefore warned that if they persist in sending immature, sunburnt, or blemished fruit that does not comply with the above standards they will be liable to prosecution.

At present some very inferior tomatoes are being placed on our local market, which are palpably immature, and in some cases diseased and badly blemished. Fruit of this nature must not be marketed, and if marketed will be liable to seizure and destruction.

INGENIOUS PIG GATE.

An Iowa (U.S.A.) farmer uses a novel home-made gate on his stock farm, which allows horses and cattle to pass, but which prevents the pigs from leaving the pasture to which it provides entrance. The gateway really is open except for a roller 14 in. in diameter, extending between the two gate posts, and just far enough above the ground so that it will work well. The roller consists of three circular plank wheels, two of which are used at the ends and one in the middle



of the roller. Boards 4 in. wide are nailed outside of these wheels, and an old piece of gas pipe is used as the central axle, holes being bored through each of the wheels for the admission of this pipe. The two ends of the pipe are anchored in the fence posts. Horses and cattle can step over the roller, but when pigs attempt to climb over it spins freely, and throws the pigs back into the paddock.—“Country Gentleman.”

PSYCHOLOGY IN DAIRYING.

Dairy cows form very strong habits (points out a writer in the South African Departmental Journal), and if the dairyman makes use of this trait much of the routine work becomes simplified and easier. Regularity in systematic operations is essential. Irregularities worry cows and undoubtedly affect the milk yield—milk production is largely a matter of nervous force. Ordinarily cows are milked twice a day at regular intervals, morning and evening. High-producing cows, however, should be milked more frequently. Whatever the periods, the milking should be done punctually and regularly, quietly and thoroughly, by intelligent, capable, cleanly, and kind milkmen.

If possible, milkmen should always milk the same cows; cows resent strange milkers. It is a good practice, supported by cow psychology, to let the milkman remove her calf and feed her a tempting ration of bran mash—she will adopt him and yield her milk to him willingly and liberally.



Photo. by Sport and General Press Agency, Limited, London.]

PLATE 151.—THE HOME-COMING

The breeders of the Wessex Saddleback Pig, a breed not yet introduced into Queensland, are keenly interested in the paddock system of feeding. They provide abundant scope and sweet, succulent pasture for their pigs. This is the system being advocated for Queensland, where both climatic conditions and environment favour the open-air system of pig-breeding.



PLATE 152.—THE CHAMPION PEN OF BERKSHIRE BACON PIGS AT THE RECENT GYMPRE SHOW, THE PROPERTY OF MR. S. POWELL, OF WINDGEE.
Note the even quality of this group and their all round excellence. 'The Berkshires' is an Ideal Farmers' Pig; useful both as a pure-bred and for crossing with the Tamworth and other breeds for Bacon Production.



PLATE 153. ROYAL AGRICULTURAL SHOW, NEWCASTLE. 241932. TAMWORTH BOAR "KNOWLE BRUCE" (2971). ROBT. HBBOTSON, FIRST AND CHAMPION AND RESERVE CHAMPION.

The Champion Tamworth Boar at the Royal Agricultural Societies Show, held at Newcastle (England) last year.

This Boar, "Knowle Bruce" (2971), was the property of that famous old breeder (recently deceased), Robert Hbbotson, of Warwickshire. The boar won First Prize and a Reserve Champion also. Note his great length and the evenness and depth of the body. The Tamworth has been improved very considerably in this regard in recent years.

Our photo. by courtesy of "Sport and General Press Agency, Ltd." London, Copyright.



Photo. by Sport and General Press Agency, Limited. London.]

PLATE 154.—A PROMINENT PRIZE WINNING TAMWORTH SOW AT THE ROYAL SHOW, DERBY, ENGLAND, 1924. "KNOWLE FAVOURITE," 2901.

PROPERTY OF THE LATE ROBERT IBBOTSON.

Note the compact deep Carcase and Fine Quality Skin and Hair.

GESTATION CHART FOR PIGS.

[illegible]

NOTE.—Black figures in above table indicate date of service.

This chart presents in an instructive form figures relating to the gestation period of brood sows. For example, a sow mated to the boar on 1st January is due to farrow on 22nd April; a sow mated on 1st July is due on 20th October. The chart should be preserved for future reference by breeders of all classes of pigs. The normal period of gestation, *i.e.*, the period from the time of conception to the birth of the young pigs, is 112 days, this period is sometimes remembered as roughly three months three weeks three days, or 16 weeks. With very young sows this period is sometimes of shorter duration, and instances are on record where young sows have farrowed at from 100 to 103 days after becoming pregnant; on the other hand, old sows in abnormal condition have been known to carry their young for more than 140 days.—E. J. SHERTON, H.D.A., Instructor in Pig Raising.

ASTRONOMICAL DATA FOR QUEENSLAND.

TIMES COMPUTED BY D. EGLINTON, F.R.A.S.

TIMES OF SUNRISE AND SUNSET.

AT WARWICK.

1924.	OCTOBER.		NOVEMBER.		DECEMBER.	
	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.
1	5 33	5 50	5 3	6 9	4 51	6 32
2	5 32	5 51	5 2	6 10	4 51	6 33
3	5 31	5 51	5 1	6 11	4 50	6 34
4	5 30	5 52	5 0	6 12	4 50	6 35
5	5 29	5 52	5 0	6 13	4 50	6 36
6	5 28	5 53	4 59	6 13	4 50	6 36
7	5 27	5 53	4 59	6 14	4 50	6 37
8	5 25	5 54	4 58	6 14	4 51	6 37
9	5 24	5 54	4 57	6 15	4 51	6 38
10	5 23	5 55	4 57	6 16	4 51	6 39
11	5 22	5 55	4 56	6 17	4 52	6 39
12	5 21	5 56	4 56	6 18	4 52	6 40
13	5 20	5 56	4 55	6 18	4 52	6 40
14	5 19	5 57	4 55	6 19	4 53	6 41
15	5 17	5 58	4 54	6 20	4 53	6 41
16	5 16	5 58	4 54	6 20	4 53	6 42
17	5 15	5 59	4 53	6 21	4 54	6 42
18	5 14	6 0	4 53	6 22	4 54	6 43
19	5 13	6 1	4 52	6 23	4 55	6 43
20	5 12	6 1	4 52	6 24	4 55	6 44
21	5 11	6 2	4 52	6 25	4 56	6 45
22	5 10	6 3	4 52	6 25	4 56	6 45
23	5 9	6 3	4 52	6 25	4 57	6 46
24	5 9	6 4	4 51	6 27	4 57	6 46
25	5 8	6 4	4 51	6 28	4 58	6 47
26	5 7	6 5	4 51	6 28	4 58	6 47
27	5 7	6 5	4 51	6 29	4 59	6 48
28	5 6	6 6	4 51	6 30	5 0	6 48
29	5 6	6 7	4 51	6 31	5 0	6 49
30	5 5	6 7	4 51	6 31	5 1	6 49
31	5 4	6 8	...	...	5 1	6 49

Phases of the Moon, Occultations, &c.

The times stated are for Queensland, New South Wales, Victoria, and Tasmania.

6 Oct. ☾ First Quarter 12 30 a.m.

13 " ○ Full Moon 6 21 a.m.

21 " ♀ Last Quarter 8 54 a.m.

28 " ● New Moon 4 57 p.m.

Perigee, 3rd and 30th October { 3 6 p.m.
 { 12 12 a.m.

Apogee, 18th October 6 18 p.m.

On the 10th October, at 8:17 p.m., Uranus will be in conjunction with the moon about three times the moon's diameter below it. This should be observable in binoculars.

On 22nd October, at about 10 p.m., Regulus will be occulted by the moon at Thursday Island, but not at Cooktown or Cairns, where Regulus will appear just above the edge of the moon; further south the distance between Regulus and the moon will appear greater.

On the 26th October, at 1:0 p.m., Mercury will be in superior conjunction with the sun—that is, on the far side of its orbit beyond the sun, where it will be quite invisible. Venus will be a morning star, and Saturn, Jupiter, and Mars will be visible in the evenings during this month.

4 Nov. ☾ First Quarter 8 18 a.m.

11 " ○ Full Moon 10 0 p.m.

20 " ♀ Last Quarter 3 38 a.m.

27 " ● New Moon 3 15 a.m.

Apogee, 15th November, 11:0 a.m.

Perigee, 27th November, 10:36 p.m.

Venus, still the most brilliant morning star, will be about five degrees west of Spica (the principal star of Vergo) on the 15th; Mars on that date will be apparently amongst the smaller stars of Aquarius, setting about half-past 1 in the morning. Jupiter will be apparently amongst the stars of Scorpio about 15 degrees to the north-east of Antares. Saturn will be visible only in the east, rising about an hour before the sun.

3 Dec. ☾ First Quarter 7 10 p.m.

11 " ○ Full Moon 5 3 p.m.

19 " ♀ Last Quarter 8 11 p.m.

26 " ● New Moon 1 45 p.m.

Apogee, 12th December, 6:36 p.m.

Perigee, 26th December, 11:12 a.m.

Mercury will be at its greatest elongation east of the sun on the 10th, and will rise and set one hour and twenty-four minutes after the sun on the 15th, apparently amongst the stars of Sagittarius. Venus will still be the brilliant morning star, rising about 2 a.m. on the 15th, apparently among the stars of Libra; Mars, having apparently reached the constellation Pisces, will set soon after midnight on the 15th. Jupiter will not be so well situated for observation, and will be lost in the sun's rays towards the end of the month. Saturn, as a morning star, will rise about half an hour before Venus in the middle of this month.

For places west of Warwick and nearly in the same latitude, 28 degrees 12 minutes S., add 4 minutes for each degree of longitude. For example, at Inglewood, add 4 minutes to the times given above for Warwick; at Goondiwindi, add 8 minutes; at St. George, 14 minutes; at Cunnamulla, 25 minutes; at Thargomindah, 33 minutes; and at Oontoo, 43 minutes.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night; when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

[All the particulars on this page were computed for this Journal, and should not be reproduced without acknowledgment.]

HEALTH FROM THE ORCHARD.

All doctors agree that fresh fruit should be eaten every day. There is convincing evidence that the constituents of the body—flesh-forming substances, fats, starches, salts, and water—when supplied in abundance paradoxically will not maintain life and health. There are certain constituents of the plant-world now known as “vitamins,” or accessory food factors, that must be added to the diet if health and growth are to be sustained. A deficiency of vitamins, with a lack of balance in the diet, not only retards growth and nutrition, but is responsible for much of the gastro-intestinal ill-health, anæmia, neurasthenia, and lack of general tone prevalent to-day, and makes people more susceptible to infection and less able to fight against disease.

The main sources of one of the most valuable vitamins are fresh fruits, especially oranges and lemons. When infants are artificially fed, it is necessary to give a teaspoonful of orange juice with two teaspoonfuls of water between feeds for a baby one month old, increased to a tablespoonful at three months. Fruit juices, generally speaking, are sources of all the vitamins, and, in particular, that which prevents scurvy. Captain Cook was able to bring the crew of the “*Endeavour*” fit and well to Sydney because he used plenty of lemon juice, decoctions of malted barley, and other vitamin-containing fresh foods. Scurvy now has no terrors for explorers provided with orange and lemon juice.

Tomatoes are rich in vitamins, and are best eaten raw.

An interesting experiment in the United States showed that a group of under-nourished children gained more weight, when given an orange a day, even than that gained by another group on a glass of milk a day.

The important mineral iron is found in strawberries, lemons, oranges, grapes, pineapples, currants, peaches, bananas, apples, apricots, cherries, and above all, in raisins.

Most sun-dried fruits are not only sources of vitamins, but are also rich in the valuable mineral salts. Raisins contain calcium, magnesium, potassium, phosphorus, and iron in such valuable amounts that, according to Mr. Alma Baker: “Every athlete, every mother, every child should cultivate the raisin habit, as it increases the red corpuscles in the blood by its iron content. If girls would make a habit of eating raisins daily they would discard the rouge pot. Twenty raisins a day keep the rouge pot away.”

The organic salts in fruit arouse the appetite and aid digestion by increasing the flow of saliva and gastric juices. They render the blood less alkaline and increase the phosphates in the red blood cells.

Fruits containing oxalates, such as tomatoes, gooseberries, and strawberries, are reputed to be beneficial in bronchitis and asthma.

Fruits containing salicylic acid, such as strawberries, raspberries, currants, blackberries, and oranges, are indicated in rheumatism.

Visitors to Trappist monasteries, where the food is mainly fruit and vegetables, with milk and cheese, comment on the fine healthy appearance, the fresh complexion, and bright, sparkling eyes of the monks.

The apple, the “king of fruits,” contains potash, soda, magnesia and phosphorus, and is an excellent brain and nerve food, with tonic and laxative properties. Professor Pickersgill, of Dunedin, has demonstrated that the acid of the apple is excellent for the teeth and gums. Thus to the old adage, “An apple a day keeps the doctor away,” we may add, “An apple a day keeps the dentist at bay.”

The banana, the “bread of the tropics,” shares with dates, figs, grapes, and nuts high nutritive properties. It possesses when quite ripe 20 per cent. of sugar.

Pears, quinces, plums, damsons, peaches, apricots, cherries, and grapes are rich in starches and salts.

In a “grape cure,” several pounds of grapes are eaten daily. Remarkable results are claimed in certain wasting diseases. They contain glucose or grape sugar easily assimilated. Grapes are said to be beneficial in chronic bronchitis, heart disease, and Bright’s disease.

Raspberries and strawberries, being highly acid, clear the blood of uric acid, and act as a tonic and stimulant. The strawberry also contains much iron, and is valuable in anæmia. Thus strawberries and cream is both appetising and nutritious.

Pineapple juice has antiseptic properties, and, together with tinned tomatoes, has prevented and cured "Barcoo rot."

Oranges are good in influenza.

Figs contain 60 per cent. of sugar, and are not only very nutritious, but possess laxative properties.

Nuts are a perfect food, with all the important constituents and little waste.

Fruits should be eaten raw on an empty stomach, or combined with nuts. On a diet of fruit and nuts the colouring of the skin improves, the complexion becomes clear, and the eyes bright. The temper improves, as there are no toxins to be eliminated. Garrod recommends oranges, lemons, strawberries, grapes, apples, and pears for gout.

To maintain an optimum of health, particularly in hot weather, people over forty especially are well advised to eat fruit for breakfast, at lunch, and as dessert at dinner, to make sure of getting enough iron, calcium, phosphorus, regulating acids, vitamins, and cellulose. At least one orange, one apple, or some fruit should be eaten by everybody every day.

REGULARITY IN LIVE STOCK FEEDING.

Although food supplied to live stock may be ample in amount, contain the ingredients which the animal requires, and be supplied under wholesome conditions, the best results will not be obtained unless some regularity of feeding is provided for. This applies more particularly to horses, calves, and pigs.

The horse has a digestive system of some peculiarity. His stomach is, for the size of the animal, very small. He has no gall bladder. The first portion of his small intestine describes a curious S-shaped curve, which is very apt to become blocked, and he has a very capacious, large intestine, which varies very markedly in diameter. The horse was evidently intended to be an animal which ate fairly constantly in small quantities, and where he is grazed naturally that is exactly what he does. But under the working conditions of civilisation it becomes necessary for the horse to spend long hours without eating, and to consume comparatively large quantities of food at one time. This, together with other details in horse management (or mismanagement) results in that most serious disease in the horse—colic.

It is very easy to overload a hungry horse's stomach, and the consequent enlargement, leading to pressure on the intestine, is difficult to overcome. It is also very easy when horses are run down by long-continued malnutrition to produce a condition of impaction of the large intestine; a long-continued case of such impaction is not easy to cure. Besides purgatives, the animals require stimulants and judicious feeding. The prevention of colic in the horse may be summed up as follows:—Provide good food in small quantities, as often as possible; feed regularly; allow plenty of water at all times; do not make the food too bulky for a working animal, but provide part of it as grain.

Similar conditions exist in the case of pigs and calves which are fed large quantities of fluid or sloppy food at long intervals. The state of distension shown by some animals fed under such conditions is unnatural, and not conducive to health. Scours, lymphangitis, and gastric and intestinal weakness are the common result.

CENTRAL EXPERIMENTAL PLOT.

The subjoined table of results is supplied by Mr. C. S. Clydesdale, Assistant Instructor in Agriculture, who supervised the carrying out of this year's tests. Soil samples taken on Mr. Turner's farm and analysed by the Agricultural Chemist showed the soil to be of a light grey, sandy nature in good physical condition with a fair quantity of lime present; there was a deficiency in humus and nitrogen, but the soil contained, otherwise, a fair quantity of mineral plant food in available form.

RESULTS.

Section.	Fertiliser Used.	Rate Per Acre.	RESULTS.											
			WHEAT.			RYE.			OATS.			BARLEY.		
			Yield from 1/40 Acre Plot.	Yield Rate Per Acre.		Yield from 1/40 Acre Plot.	Yield Rate Per Acre.		Yield from 1/40 Acre Plot.	Yield Rate Per Acre.		Yield from 1/40 Acre Plot.	Yield Rate Per Acre.	
				LB.	T. C. Q. LB.		LB.	T. C. Q. LB.		LB.	T. C. Q. LB.		LB.	T. C. Q. LB.
A.	Unmanured	..	..	..	LB.	T. C. Q. LB.	LB.	T. C. Q. LB.	LB.	T. C. Q. LB.	LB.	T. C. Q. LB.
B.	Basic Super.	..	..	224	184	3 5 2 24	108	1 18 2 8	167	2 19 2 16	156	2 15 2 24
C.	Super.	..	..	224	195	2 9 2 16	116	2 1 1 20	183	3 5 1 12	173	3 1 3 4
D.	Meatworks	..	..	336	203	3 12 2 0	137	2 8 3 20	172	3 1 1 20	165	2 18 3 20
E.	Blood	..	..	224	276	4 18 2 8	159	2 16 3 4	208	3 14 1 4	184	3 5 2 24
F.	Basic Super. Potash Nitrogen (Blood)	..	..	224	283	5 1 0 8	176	3 2 3 12	226	4 0 2 24	197	3 10 1 12
		..	..	224	269	4 16 0 8	143	2 11 0 8	189	3 7 2 0	175	3 2 2 0
		..	..	112								
G.	Unmanured	..	..	..	223	3 19 2 16	128	2 5 2 24	171	3 1 0 8	147	2 12 2 0
H.	Super. Potash Nitrogen	..	..	224	246	4 7 2 12	144	2 11 1 20	178	3 3 2 8	149	2 13 0 24
		..	..	112								
		..	..	112								
I.	Basic Super. Potash Nitrogen (Blood)	..	..	112	243	4 6 2 4	142	2 10 3 24	174	3 2 0 16	157	2 16 0 8
		..	..	56								
		..	..	56								
J.	Basic super. Potash	..	..	224	239	4 5 1 12	123	2 3 3 20	183	3 5 1 2	148	2 12 3 12
K.	Basic super. Nitrogen (Blood)	..	..	224	253	4 10 1 12	147	2 12 0 20	169	3 0 1 12	136	2 8 2 8
		..	..	112								
		..	..	112								
L.	Potash	..	..	112	238	4 5 0 0	135	2 16 0 8	157	2 16 0 8	141	2 10 2 12
M.	Unmanured	..	..	..	217	3 17 2 0	119	3 1 3 4	173	3 1 3 4	132	2 7 0 16

General Notes.

Advantages of Oats.

Oats have certain advantages over barley, which to a lesser degree apply to wheat. These are:—

1. They are less liable to diseases and frosting.
2. They give a heavier crop in most seasons.
3. They have a better feeding value.
4. More fodder is grown after grazing or cutting.

Some complaint has been made of the unpalatable nature of green oats as compared with barley and wheat, and certainly stock prefer oats in the dry state or (except in the case of horses) as silage, but they will take to the feed after a while. Mulga and Sunrise are preferred to Algerian.

A Vigorous Crop.

The chief reason why oats have not been more grown is that they have always given place to wheat, and are seldom grown on fallow. The risk of lodging, given as a reason for not sowing on fallowed land, is in itself an indication of the vigorous nature of the crop and its value for grazing. By judicious choice of varieties, oats can be grown on any farm, and are a cheaper crop to handle than maize. Wheat-growers who are desirous of increasing their sheep-carrying capacity would do well to try oats as a means of tiding themselves over times of shortage and as an aid in lamb-raising.

The importance of early maturity in oats is strongly emphasised. For early lambs one must have early feed, and Algerian oats no longer fill the bill.

The growing of oats on the farm would save the trucking of maize from the coast. If in the shape of straw and grain, there is no danger of the grain sweating if it is put dry into a tank or bin, as is done in parts of Victoria. Our early varieties grow tall enough and the seed is plump enough even in the dry districts.

As competition becomes keener, land values higher and settlement closer, farmers will turn more to oats in connection with stock-raising—primarily for grazing, choosing the most palatable sorts, but also for use in the form of silage, chaff, and grain.

Oats for Fodder.

The value of oats as food for stock is not sufficiently appreciated, says one of the plant breeders of the New South Wales Department of Agriculture. The idea that it is only possible to grow them in districts with a comparatively good rainfall has limited the production, but we now have such early-maturing sorts as Mulga, Sunrise, and Lachlan, which yield a payable crop in any district in which wheat will grow.

For sheep, cattle, and horses the oat is an ideal ration. Sheep men will admit the value of a reserve of fodder for a dry time and the value of a grazing crop for lambing ewes, but it is wise to supplement the natural pasture as a regular thing. Reserves may be kept in the form of hay or, if mice are bad, straw and stripped grain, stored preferably in large corrugated-iron tanks. Such fodder would provide, with pasture, sufficient feed throughout the year, keeping the wool uniform and unbroken in staple, the sheep in good condition, and fattening early lambs. Dairymen usually "bank" on the maize and summer fodders, putting up with a diminution of the milk flow during the late winter and spring months. This gap is filled well by oats, to be cut and fed to the cows—the paddock can be shut up for a second and often a third cut before the maize comes in. For horses many prefer to feed wheaten chaff, but even where oaten hay is not used all farmers appreciate the addition of whole or crushed oats to the ration.

Bailey's Queensland Flora at a Reduced Rate.

With the object of making the "Queensland Flora," by the late F. M. Bailey, available to officers in the Government service who might find it of use to them in their work, such as officers of the Department of Agriculture and Stock, of the Queensland Forest Service, and school teachers, it has been decided to reduce the price to officers to whom the book would be useful in their work from £1 10s. to £1 the set of six volumes and general index. Applications for the work at the reduced rate accompanied by remittance should be made to the Under Secretary, Department of Agriculture and Stock, Brisbane, or direct to the Government Botanist, Botanic Gardens, Brisbane.

Misleading Land Advertisements.

Recently the Minister for Agriculture and Stock (Hon. W. N. Gillies) had occasion to refer to what he described as the ill effects of land speculation generally, and on the banana industry in particular, and said that his attention had been called to what he considered misleading advertisements concerning the profits that could be made out of banana growing in Queensland. He had always argued that land (particularly in a country like Queensland) supplied free of charge by the Almighty for the use of the people should be reasonably priced, and that cheap land and high wages went hand in hand, whereas dear land was always an argument in favour of lower wages and lower returns for the man who worked the land—the farmer. A few years ago, he continued, land speculators on the Tweed River received as high as £130 an acre for unimproved land. Some of this land had been sold thirteen or fourteen years ago for £5 and £6 an acre. A few years later bunchy top broke out, and scores of industrious banana growers were ruined. The banana industry, though profitable in places, was subject to numerous pests and diseases, and there was no reason why fabulous prices should be paid by honest and industrious farmers to increase the profits of speculators and commission agents.

Bacteria in the Bucket.

Interesting determinations of the contamination of milk by unclean milking buckets have been made at Hawkesbury Agricultural College. Pails were scrubbed in cold water, washed in hot soda water, and then divided into two groups. One group was rinsed in hot water (145 to 155 deg. Fahr.), inverted on drying shelves and left for four hours. The other group of pails were steamed for sixty seconds and inverted on the same set of shelves to dry.

The average bacterial content of the two lots of buckets showed that the bacteria added to the milk by utensils can be reduced by more than 90 per cent. if steps be taken to partly sterilise them. The use of steam on the farm is only exceptionally possible at present, but immersion of well-cleansed utensils in vigorously boiling water, in which they are allowed to remain until they have attained its temperature, and left for four hours. The other group of pails were steamed for sixty seconds and inverted on the same set of shelves to dry.

1. Thorough scrubbing in cold or lukewarm water. Hot water at this stage makes cleaning very difficult.
2. Scrubbing in a hot soda solution.
3. Immersing in actively boiling water for ten or more seconds.
4. Inverting to dry in a sunny, dust-free atmosphere.

Rapid drying is very important, because without moisture bacteria cannot increase their numbers. Immersion in boiling water or steaming means rapid drying, because hot water runs off vessels almost twice as readily as cold, and the heated metal rapidly evaporates the water film. Most utensils sold by reputable suppliers are now made free from corners and crevices difficult to clean and forming infective foci. Battered or rusty utensils are a constant source of milk infection, because they are impossible to clean. A piece of such a can under the microscope has a surface consisting of ridges and valleys, craters and peaks, and in the recesses microbes and milk are safe from brush, and well guarded against heat.

Where whey is conveyed in the milk cans, particular care should be taken with their cleaning. Such cans are apt to be greasy, are certainly heavily infected with bacteria, and, if not thoroughly cleaned and scalded, will heavily contaminate the milk. Whenever there is doubt of a can having been properly attended to, it should be well scalded and cooled before milk is placed in it.

A Northern Sanctuary.

The reserve for recreation, camping, and water at the Johnstone River Falls, Malanda, has been declared a sanctuary in which it is unlawful for any person to take or kill any animal or bird, in accordance with "*The Animals and Birds Act of 1921.*"

The Press and Farmers' Organisation.

In the course of a recent reference to Agricultural Council matters, the Minister (Hon. W. N. Gillies) expressed the opinion that much of the criticism in the country was due to the fact that sufficient publicity was not given to the council meetings. He had expressed the view recently that the council would have been well advised to have admitted the Press to its meetings. The Brisbane Press generally had been sympathetic towards the new scheme of organising farmers, and if the discussions at the council meetings were published in the daily newspapers he thought the effect would be all in favour of the council.

Ratoon Cotton Advance.

The Minister for Agriculture and Stock (Hon. W. N. Gillies) has announced that, until the 31st July, 1925, an advance of 3d. per lb. will be paid to growers for ratoon seed cotton of good quality, clean and free from disease, delivered at a ginnery. This advance will be subject to a reduction in the case of ratoon cotton delivered at a factory not complying with the conditions for the advance of 3d. per lb. If, after the payment of all expenses for ginning and marketing, there is any surplus arising out of the sale of the ratoon cotton lint over and above the original 3d. per lb., the surplus will be distributed among the ratoon cotton growers.

Banana Grade Standards.

In lieu of the former grade standards for Cavendish Bananas—"Choice," "Firsts," and "Seconds"—the following standards have now been approved:—

"Special" shall mean sound fruit, free from blemish and properly packed, having a minimum length of eight inches and a minimum circumference of five inches.

"Choice" shall mean sound fruit, properly packed, having a length of less than eight but not less than seven inches and a minimum circumference of four inches.

"Standard" shall mean sound fruit, properly packed, having a length of less than seven but not less than five and one half inches and a minimum circumference of four inches.

Distributing the Risk—Diversified Farming.

Farm cost figures gathered from North Dakota farms for the past five years (says a North Dakota Agricultural College circular) seem to indicate beyond any doubt that a well-balanced system of agriculture pays best in the long run. The one-crop farmer may possibly make a big stake one year, and even for several years, but he is bound to fall when hard times strike him.

Farming at best is pretty much of a gamble, and one-crop farming is the most extreme type of gambling that a farmer can indulge in. Making good as a farmer is a job of a lifetime, and it is the average net income over a period of fifteen to twenty years which determines a man's success or failure. For this reason it seems desirable to eliminate as much of the risk as possible. The farm having several sources of income is not entirely dependent upon any one of these, and a total failure on a farm of this kind is practically impossible. Livestock products bring an income every month which can be used to pay grocery bills and other current expenses. The farmer who raises a large percentage of his own food has always got something to live on, even if times be rather hard.

It seems, therefore, that the system of farming which pays the best, and the system which insures the greatest degree of safety, is a well-balanced system providing for a definite rotation of crops, and providing, also, for the raising of live stock. Farm cost figures seem to indicate that the diversified farmer with considerable investment in live stock is usually the farmer who weathers hard times best in any community. The one-crop farmer or the man who depends almost entirely upon crops to the exclusion of live stock is generally the man who goes bankrupt first of all when hard times hit the community.

Fruit Fly Lure.

The Minister for Agriculture (Hon. W. N. Gillies) stated recently that, following on the interest taken by the Department of Agriculture in the Harvey Fruit Fly Lure, which commenced with the supervision of a number of experiments as to its efficacy, an agreement has now been entered into and arrangements made with Mr. Harvey, the result of which growers will be enabled to secure supplies of a standardised lure at a cost very much lower than would have been the case had the sale of the lure been continued by Mr. Harvey on ordinary business lines. Briefly, the agreement is to the effect that Mr. Harvey will manufacture and supply enough lure at all times to satisfy the demands of the growers at a standardised strength, so that when one part of the lure is mixed with 10 parts of water the lure will be in a useable form. The price of the lure is 10s. per gallon, plus packing costs. In the event of an improved lure being substituted any increase in the cost of manufacture of the specific will be met by an increase in the price of the lure. To enable this to be done the Government has given material assistance financially to Mr. Harvey. This agreement being completed, arrangements are now being made whereby growers will be able to secure, at the price indicated, supplies of the lure of a standard quality with as little delay as possible.

Slaughtering Act Regulations.

The Regulations under the Slaughtering Act have been revised, some being completely altered, while others are as formerly, with possibly a few minor alterations to conform with present-day needs. The main alterations are as follow:—

1. Fees for inspection (Regulation 37).—These have been increased to compare with the Southern States and the Commonwealth and in accordance with existing values, the alterations being:—

Present Fees.					New Regulations.				
					Each.				Each.
Cattle	..	..	..	..	3d.	..	..	..	6d.
Sheep and Goats	..	..	..	..	½d.	..	..	..	1d.
Calves	..	..	..	..	½d.	..	..	..	3d.
Swine for pork	..	..	..	..	3d.	..	..	..	3d.
Swine for curing	..	..	..	..	1d.	..	..	..	3d.

2. Regulation 5.—A slaughtering license is increased from £1 to £2 each year, and the transfer fees from 2s. 6d. to 5s. This regulation also provides that no extra fee shall be required for a provisional license, but if the licensing authority finds that the alterations necessary before the issue of the license have not been executed, the provisional fee shall be forfeited.

3. Regulation 1.—The age for a holder of a slaughtering license must not be less than twenty-one years, and the term "owner" covers all degrees of partnership. Trouble has before been experienced in deciding the ownership.

4. Regulation 6 provides that a license to be issued shall date from the application instead of, as formerly, from the date of actual issue.

5. Regulation 7 (c).—A new provision giving power to the court to refuse an application to anyone who, within the previous three years, has been convicted of cattle stealing or of offences under the Diseases in Stock Acts or the Brands Acts.

6. Regulation 11 requires the clerk of petty sessions to keep a register of licenses issued which the public can examine at any time on payment of a fee of 2s.

7. Regulation 12 increases the time wherein an aggrieved person may present his grievances from seven days to fourteen days.

8. Regulation 17 prohibits the slaughter of any cow for human consumption within fourteen days of parturition.

9. Regulation 26 requires that the disposal of blood shall take place at least 80 yards from the slaughter-house and be buried 18 inches deep.

10. Regulation 30 requires privies and urinals to be 80 yards from the buildings.

11. Regulation 33.—Pig stys must be roofed and drained; swine to be fed on concreted floor, and must not be fed on the flesh of any animal other than an animal that has been slaughtered.

12. Regulation 69.—The boiling pots and vats shall be 80 yards from the slaughtering place.

Levy on Stanthorpe Fruit and Vegetable Growers.

A Regulation has been issued under the Primary Producers' Organisation Acts providing that the levy that is being made on fruit and vegetable growers in the Stanthorpe district, may be collected by the Railway Department at the recipient's end of the journey and not at the sender's end.

Pig Raising—Instructor's Itinerary.

Following is Mr. Shelton's itinerary for the remainder of the month:—

Monday	Dec. 15	—Attend at pig trucking at Wooroolin during morning. Address farmers and give lantern lecture, Murgon 8 p.m.
Tuesday	„ 16	—Attend at pig trucking at Mondure in the morning. Address farmers and give lantern lecture at Boonara at 8 p.m.
Wednesday	„ 17	—Visit farms in Wondai district and give lantern lecture, Wondai 8 p.m.
Thursday	„ 18	—Return to Brisbane.
Friday	„ 19	—Attend official laying of Foundation Stone of new Curing Rooms at Queensland Co-operative Bacon Factory, Murarrie.
Saturday	„ 20	—Head Office.

Note.—Visits will be paid to State Schools where possible and addresses given to the school children, who, with their parents, are welcome to attend all lectures. Unless otherwise arranged locally by L.P.A.'s, the lantern lectures will be given in the State Schools at each centre visited.

The Cultivation of Beet.

Beetroot is a favourite summer vegetable. It can be grown almost anywhere and on practically all soils, but those of a heavy, clayey nature are the least suitable, and good crops of best quality cannot be expected under those conditions.

Beet has a taproot, and requires deep working of the soil. Very rich soils are not altogether suitable, as with this crop extra large roots are not popular. For the same reason it is well not to overplant too early in the spring, as, if not quickly used, the roots become too large before the season is over. Smaller successive sowings will be found to answer requirements much better. The seed can be planted throughout the year, except during the cold, wet, winter months. For good quality, the crops should be quickly grown, as otherwise they become somewhat tough, woody, and coarse flavoured.

The position should be a sunny one, and, for household plots, rows 12 inches apart are sufficient. For commercial culture the rows should be spaced not less than 15 inches apart, and even up to 30 inches. The seed as purchased is fairly large and has a corky appearance; this is really the seed fruit, which contains several seeds. The germination is sometimes disappointing, but this is mostly due to faulty sowing. Should the surface soil be dry and light in texture, the seed must be planted deep in order to reach the moisture, but if damp, a depth of about 1 inch is sufficient.

To get the moisture through the corky covering of the seed is always very difficult, and to overcome this it is usual to soak the seed overnight previous to planting. Where possible the seed should be spaced about 1 inch apart in the drills and thinned to at least 4 or 6 inches apart, according to the variety. When young, the plants can be transplanted if carefully handled so as not to interfere with the roots, but this course is only recommended where there are wide spaces in the rows as the result of faulty germination; the plants from the thicker portions of the field may then be utilised for this purpose. The crop needs little attention other than cultivation to keep down weeds and a sufficient supply of moisture. The roots can be used for household purposes as soon as they are large enough, but they should not be forwarded to market until more fully developed. In marketing, neither roots nor tops should be trimmed.

Great care must be exercised in harvesting, as bruising or breaking of the taproot is a serious drawback, causing bleeding to take place in cooking, which leaves the vegetable very pale in colour. The beet is rich in sugar, and, if allowed to bleed, a large quantity of this constituent is also lost. In cooking, if the utensil is large enough, it is always advisable to allow the tops to remain, but if the vessel will not permit of this, screwing off the tops is preferable to cutting them.

The long varieties are not favoured by housewives on account of the difficulty of accommodating them in ordinary pots; for this reason the turnip-rooted sorts are more popular. Varieties recommended are Eclipse, Egyptian, Crimson Globe, and Electric.

Central Cane Prices Board.

The Central Sugar Cane Prices Board has been constituted to consist of the following members, as from the 13th November, 1924:—

His Honour Mr. Justice O'Sullivan—Chairman;
Thos. A. Powell—Canogrowers' Representative;
Bernard R. Riley—Millowners' Representative;
J. McC. MacGibbon—Qualified Sugar Chemist; and
A. R. Henry—Person experienced in accountancy and audit.

Butter Board.

Notice of intention to declare that butter produced at factories in Queensland shall, for a period of three years as from the 22nd November, 1924, be a commodity under and for the purposes of the Primary Products Pools Acts, has been issued. If cream suppliers and butter factories are in favour, a Board will be constituted to consist of five representatives of growers and one to represent the Council of Agriculture. Representatives of growers will be elected by butter companies, and if a company has more than one factory, it will be entitled to a vote for each factory. The companies operating in the State are divided among five different divisions, and each division shall elect one representative. The Board, if constituted, will be empowered to make levies on companies when necessary to meet payment of allowances and expenses to members of the Board as the Minister for Agriculture may think fit. No company shall deliver butter to the Board before the date to be published by the Minister in the "Government Gazette." Until such date, on Saturday in each week, every company shall deliver to the Board, in respect of each of its factories, a return showing the quantity of butter manufactured during the past preceding seven days, and the names and addresses of the persons to whom such butter was delivered or consigned. Agents for the sale of butter will furnish similar returns. The Board will also be empowered to make monetary arrangements necessary to effect equalisation of returns to companies. The Minister may appoint any person or persons to inspect and take copies of books, papers, vouchers, &c., of any company or agent, for the purpose of ascertaining or verifying any particulars mentioned in returns of companies. Persons eligible to vote on any referendum or election in connection with the said Board shall be representatives of companies manufacturing butter in the State of Queensland.

Grain Board.

Notice of intention to declare that maize produced from seed sown after the 1st July, 1923, in any part of Queensland, other than the Petty Sessions Districts of Atherton, Herberton, and Chillagoe, shall, for a period of three years from the 22nd November, 1924, be a commodity under and for the purposes of the Primary Products Pools Acts, has been issued. If 75 per cent. of maize growers are in favour of the constitution of the Board, the Board to deal with the crop will be constituted, and will consist of seven elected representatives of the growers, and one person to represent the Council of Agriculture. The growers' representatives will be elected as follows:—

District No. 1 (comprising Pastoral District of Moreton)—Two representatives.

District No. 2 (comprising Pastoral Districts of Darling Downs and Maranoa)—Three representatives.

District No. 3 (comprising whole of Queensland with exception of Districts 1 and 2, and the Petty Sessions Districts of Atherton, Herberton, and Chillagoe)—Two representatives.

The members of the Board, when elected, will hold office for twelve months as from the date of appointment. Persons eligible to vote on any referendum or election before the 30th June, 1925, shall be persons who have, at any time subsequent to the 1st July, 1923, grown for sale maize in any part of Queensland other than the Petty Sessions Districts of Atherton, Herberton, and Chillagoe, and persons eligible to vote at any subsequent referendum or election shall be persons who, at any time during the twelve months preceding such election or referendum, grow for sale maize in any part of Queensland excepting the abovenamed Petty Sessions Districts.

In addition to the usual powers of the Board provided by the Primary Products Pools Acts, the Board may encourage, provide, or assist in providing grain sheds, or engage in other activities as may be approved by the Governor in Council, on the recommendation of the Council of Agriculture.

During a period to be published later, the Board will control the marketing of all maize, marketing including everything involved in the transmission of maize from the producer to the consumer. After such period, the marketing shall be carried on only under the authority of the Board.

A further clause provides that control similar to that described may, from time to time, be extended to oats, barley, rye, canary seed, wheat, and other grain grown within Queensland, provided the provisions of the Primary Products Pools Acts are duly observed.

In order to ensure their names being on the roll of persons eligible to vote in connection with the Board, all persons who grew maize from seed sown after the 1st July, 1923, are invited to send their names at once to the Under Secretary, Department of Agriculture and Stock, Brisbane.

State Wheat Board Election.

The result of the election of a member to represent No. 4 District (old Cunningham electorate) on the State Wheat Board was as follows:—

Thomas Muir (Allora)	..	..	..	..	323 votes
Richard Roche (Emu Vale)	..	..	..	..	165 „

As this was the only election necessary for the Wheat Board this year, the following have now been appointed members of the Board, to hold office for one year from the 2nd December, 1924:—

Mark Harrison (Chairman), Robert Swan, A. J. Harvey, B. C. C. Kirkegaard, Thos. Muir, and J. T. Chamberlain.

Canary Seed Board.

Notice of the intention of the Governor to create a Canary Seed Board has been issued. This Board will control canary seed harvested within Queensland during the season 1924-1925—viz., 1st March, 1924, to the 28th February, 1925. If constituted, the Board will consist of three members, one to represent the Council of Agriculture and two to be elected by growers. Nominations will be received by the Under Secretary, Department of Agriculture and Stock, not later than the 8th December, 1924. Such nominations must be signed by at least ten growers of canary seed—i.e., persons who have grown canary seed for the 1924-25 season as defined above. Any petition for a poll to decide whether the Canary Seed Board shall be formed, must be signed by at least fifty growers as above, and must reach the Minister for Agriculture before the 15th December, 1924. In order to insure their names being on the roll of persons eligible to vote, growers of canary seed are invited to send their names at once to the Under Secretary, Department of Agriculture and Stock.

Destruction of Cotton Plants (Black).

Following on the proclamation recently issued declaring the 22nd November to be the day on or before which all cotton plants must be either destroyed or cut down, the 13th December has now been proclaimed as the date on or before which all such cotton prunings, &c., shall be destroyed by fire.

Inspection of Maize for Export.

The Secretary for Agriculture and Stock (Hon. W. N. Gillies) referred recently to a Press paragraph on the subject of the alleged severity of the inspection of the maize submitted for export overseas. Mr. Gillies pointed out that, in the first place, although this inspection is carried out by departmental officers, they are really acting for the Commonwealth Government under the Commerce Act. By an arrangement between the State and Federal Governments various officers of the Queensland Department of Agriculture and Stock have also been appointed Federal officers for the purposes of the Commerce Act. With regard to the maize exportations, Mr. Gillies stated that over half a million bags had already been exported from Brisbane overseas since the beginning of September in this year, and the quality of the maize coming forward had been quite up to the standard required by the Commerce Act, so much so that the rejections have only amounted to a few hundred bags out of the five hundred thousand bags.

The inspection is conducted at the wharves and the examining officers do everything in their power to assist in the exportation, in so far that they are prepared to sample every individual bag in the event of some inferior bags being found on a particular lorry. The result is that because one bad bag may be discovered on a lorry it does not necessarily follow that all the bags on that lorry are condemned. The special complaint mentioned in the Press recently may have originated from the case of a firm that submitted several lorry loads of Burnett maize at a wharf. At the commencement of the examination some inferior bags were discovered and the inspectors offered to test every bag in the consignment in order that good bags might not be rejected equally with bad ones. The merchant, however, in this case did not avail himself of the consideration

offered him, but had the lorries in dispute returned to his produce sheds. He intends regrading the whole of the maize and submitting again for export. The inspectors feel confident that the bulk of it will pass.

The Minister said that while his Department desired to assist in every possible way in the export of surplus maize, it had to be remembered that this was the first year that maize was exported from Queensland in any appreciable quantity, and that it was therefore highly important that the good name of our grain should not be injured by allowing bad samples to be exported. He wished to make it quite clear that the statement, which had evidently been circulated with an object, that the Council of Agriculture was responsible for rejecting maize for export, was absolutely untrue. He also drew attention to a paragraph that appeared in the last issue of "The Farmers' Gazette" in which it was stated that Messrs. Denham Bros. were of opinion that the Department had acted with great discretion, and that its inspectors had deserved every credit for the able manner in which they had carried out their duties in the matter of maize inspection.

Staff Changes and Appointments.

Constable R. Wilson, of Yungaburra, has been appointed an Inspector of slaughter-houses.

Mr. P. Rumball, Poultry Instructor, and all Inspectors of Stock, have been appointed Inspectors of Poultry, as from the 22nd November, 1924.

Successful examinees listed as follows, have been appointed Inspectors under and for the purposes of the Dairy Produce Act:—M. D. O'Donnell, Rosewood; P. A. Kelly, Newtown, Toowoomba; Daniel Culhane, Cambooya; and G. F. E. Clarke, Wyreema.

Constable J. H. Johansen, of Kurilda, has been appointed an Inspector of Slaughter-houses.

Messrs. L. W. Ball and S. T. J. Clarke, Field Assistants to the Department of Agriculture and Stock, have been appointed Managers of the Cotton Experimental Farms at Melton and Monal Creek, respectively.

Mr. N. E. Goodchild, Senior Field Assistant to the Cotton Section of the Department of Agriculture, has been appointed an Inspector under and for the purposes of the Cotton Industry Acts.

Constables A. McCreath and A. B. Clarke, of Stonehenge and Rosewood, respectively, and Mr. Thos. Crawford, of Brisbane, have been appointed Inspectors of Slaughter-houses.

Messrs. Jas. Munro, D. H. Stewart, T. E. Smith, and T. W. Smith, of Stanthorpe, have been appointed Inspectors under and for the purposes of the Diseases in Plants Acts.

The resignation of Mr. C. Storey, as Chairman of the Cattle Creek, Farleigh, Marian, North Eton, Palms, Plane Creek, Pleystowe, and Racecourse Local Sugar Cane Prices Boards, has been accepted, and Mr. F. J. Cherry, Police Magistrate, appointed in his place.

At a recent Executive Council meeting the following appointments to the Department of Agriculture and Stock, with consequential staff adjustments, were approved:—

Mr. E. Graham was appointed Under Secretary, Mr. R. Wilson, Assistant Under Secretary, and Mr. R. P. M. Short, Senior Clerk to the Department. Following on these appointments the existing positions held by Messrs. Graham, Wilson, and Short, namely, Director of Dairying and Cold Storage, Chief Clerk, and Senior Clerk to the Stock Branch, respectively, have been abolished.

Messrs. R. C. Lake and F. J. Webster have been appointed Government Representatives on the Dingo Boards for the Dingo Districts of Gregory and Burke respectively.

Mr. H. Vinnicombe, of Manly, has been appointed an Honorary Inspector under the Diseases in Plants Acts.

Mr. J. P. G. Toft, of the Lands Office, Bundaberg, has been seconded for duty to the Agricultural Bank and appointed Acting Inspector for three months from the 27th December.

Constable G. Beale, of Roma, has been appointed an Acting Inspector of Stock.

Queensland's First Big Export of Maize.

Practically this is the first year in which Queensland has been in a position to be able to test the world's markets with supplies of maize, and the crop immediately following on the big drought has been such that there was no alternative but to send substantial shipments overseas. So far as concerns the present season, this effort is now practically at an end, and we have obtained from Denhams Limited some particulars of what has been done. Up to the present this firm has shipped about 100,000 bags, and other merchants in the State have together made shipments amounting to possibly 300,000 bags—say 400,000 bags in all, or 30,000 tons; and it should be said that many of the merchants have taken big risks in consigning this maize to London. (Up to the first week in December 496,523 bags had been shipped for export at Brisbane—Ed. "Q. A. J.") The first lot was sent over by Denhams Limited in April last by the steamer Waimatti. This, unfortunately, became affected slightly with weevil on the voyage and as a consequence it involved a loss of nearly £3 per ton. However, it was not a large parcel, and its main purpose was to afford information as to the bags that should be used. Those employed in the initial shipment proved satisfactory to buyers, and this shipment has become the pioneer of a very considerable trade.

We are informed that the whole of the maize that has been shipped was purchased in the country districts where grown, and at prices which have left an exceedingly small margin for the shippers.

It is obvious that if trade along these lines is to be continued and developed, all concerned must do their part, and it is gratifying to know that, on the whole, there has been but little cause for complaint against those engaged either in the production or transport of the commodity. Unfortunately, there has been here and there a farmer who ventured to send stuff which he ought to have known would not pass inspection, thus making both buyer and shipper suspicious, and causing much anxiety to those responsible for the soundness of the consignment.

In our opinion, said Mr. Brett, manager for Denhams, the Department of Agriculture has acted with great discretion, and its inspectors deserve every credit for the able manner in which they have carried out their duties. It has not been their fault if any maize was shipped that ought to have been kept back. "We have had maize rejected," said our informant, "but simply because a few bags had been put into a given truck, on the chance of getting it through, and this has had the effect of condemning the whole truck of grain." Other merchants, it was explained, had been placed from time to time in a similar position. It will have to be recognised by growers that it is of no use trying to palm off any maize that is soft, or with a touch of mould, or a sourish smell. In fact, it must be dry, clean, sound grain in order to pass the inspection.

Another point to which Mr. Brett referred was the great assistance afforded by the Railway Department in forwarding the maize from country stations to the ship's side. It was well known that there was at the present season a great demand for trucks for sugar, wool, and other commodities, and in addition came this big demand for transport of maize. We have been in the habit of talking in truckloads, and 1,000 bags has been regarded as a big order; but right in the midst of the busy season for sugar and the export trade in that commodity, together with the regular wool sales, came the demand for conveyance of thousands of tons of maize. As far as was known, said our informant, in no single instance had a boat been missed with shipments of maize booked for it. Indeed there had been times when it would have been quite acceptable had trucks of maize been held up for a few days, as it was coming to hand more rapidly than it could well be disposed of.

The shipping agents also had done all that was possible for them to do; but of course it had to be remembered that Brisbane is not as yet equipped for the handling of large quantities of grain. This trade is quite a new departure, and taking everything into consideration, it would seem that farmer, merchant, shipping agents, the Railway Department, and the inspectors should be congratulated on the results attained.

It is pointed out that the future shipping of maize, so far as concerns the disposal of this year's surplus, depends entirely on the activity or otherwise of the weevil. It is thought that the Downs maize will be quite safe for shipment about February. But the new maize will probably weevil quite quickly on account of the character of the present dropping season, the moisture in the grain and in the atmosphere being favourable to the development of the insect. Unfortunately, Brisbane is not as yet equipped with proper grain drying apparatus. What is needed is the erection of a huge kiln at the water front, so that maize on arrival from the country could be effectively dried. If this were done there is little question that ship owners would fit up their vessels for the carrying of grain in bulk, thus doing away with the expense of providing bags, which in itself is a very heavy tax on the industry.—"Farmers' Gazette," 25th November, 1924.

Answers to Correspondents.

Carob Bean.

“DRUMTOCKTY (Gympie)—

Individual Carob-bean trees bear either male or female flowers respectively. As you appear to have only one tree it is unlikely this will bear pods or seed. It takes about seven years for a Carob-bean tree to bear pods—i.e., when conditions are favourable for their production.

Pumpkin Storage—Eradication of Mosquitoes.

W. W. (Cootharaba)—The Director of Agriculture (Mr. H. C. Quodling) advises:—

- (1) In storing pumpkins care should be taken to see that the stalk is cut and not twisted off as is usually done in the field.

In the case of the stalk being broken away from the pumpkins premature decay sets in, and the fruit is unsuited for storage purposes. Similarly, pumpkins should be carefully handled in order to avoid bruising. Store on a thick bedding of dry grass or straw away from all dampness. Prevent pumpkins from touching one another by wisps of straw placed between the pumpkins.

Do not, under any circumstances, store more than two layers deep, unless the pumpkins are particularly undersized. The variety known as Ironbark is the best for storage purposes, and will keep under these conditions for several months.

- (2) Use kerosene for eradicating mosquito larvæ. No harm will be done to the water, provided that an excess quantity is not used. In a 1,000-gallon tank two egg-cupfuls will be found to be sufficient.

It is, however, suggested that a better method would be the removal of the cause by screening all inlets and outlets of the tank with fine copper wire gauze.

Pig Feeding.

One of our Northern correspondents recently sent in the following inquiry:—

“Would you be good enough to let me know the proper amount of food to feed pigs to get them ready for baconers in two months’ time? I have got four pens of store pigs, with four pigs in each pen—that is, sixteen pigs in all; the weight of these pigs would go roughly 60 lb. each live weight.

“What would be a good ration of feed to give the sixteen pigs per day? I have got the following feed:—Forty gallons of separated milk per day, molasses, pollard, cracked maize, Meggitt’s linseed meal and cocoanut oil cake. The pigs are in a fair condition now. What quantity of each of the abovenamed would you advise me to give them per day, as I want them in prime condition in about two months’ time. Is it necessary to scald the meals, or will they do mixed with the milk the way they are?”

The Instructor in Pig Raising, Mr. Shelton, advises:—

Provided you have a liberal supply of skim milk and some cereal concentrate like pollard or crushed maize (maize meal) there should be little need to use linseed meal, cocoanut oil cake, or molasses, for a liberal supply of green food (flesh formers) in addition to the milk and maize should make up a sufficient supply of protein in the ration.

For my own use I would prefer to cook the maize meal or soak it in hot water, and when it had made up into a porridge, add skim milk to make it the consistency of cream, and feed same in that way, giving the pigs a liberal supply of skim milk as well (after this food had been consumed). Pollard is a much more satisfactory food for very young pigs, and its addition to skim milk in the proportion of 3 to 4 lb. to the gallon of skim milk is advised. To this ration for pigs from three to four months old, you might add 10 per cent. of linseed oil meal, and whilst doing this it would be very interesting to try one pen with cocoanut oil cake as well. Both these meals should be soaked in scalding water overnight, and the correct proportions added to the feed next morning. After adding the hot water to soak the meal cover the container with a heavy cornsack or two, and the result will be better.

We do not favour the use of molasses in good seasons when there is an abundance of green food, for it is expensive and is unnecessary. It certainly is a very useful addition to the ration in periods of short supply of green foods. In regard to quantity to be given of this mixed ration to your fattening pigs, the best advice is to give the pigs just as much as they will clean up at each meal and feed them twice daily. If the weather is cool an extra feed will hurry them on, but do not overfeed in hot weather, or you will have some losses. Allow the pigs liberal exercise in a roomy pasture in preference to shutting them up in a small sty. Fattening pigs will not over-exercise themselves if they have plenty of food, and the grass, &c., will be an advantage in so far as flesh forming goes, and the factories all want fleshy pigs in preference to very fat "blubbers of lard." The pig that gets all concentrated food and no exercise or flesh-forming foods, is an unprofitable sort. Meat meal used in less than 10 per cent. lots is useful, but if there is plenty of green food you do not require much meat meal. You will note also, that on a falling market, you should aim at keeping the cost of the ration down as low as possible, hence the less linseed or cocoanut oil meal used the better. Home-grown green foods are far to be preferred to high-priced concentrates.

Bacon Factories.

An inquirer has asked for information affecting the development of the pig industry in one of the Western mixed farming and wheat-growing areas. Our correspondent stated, *inter alia*:—

There appears to be an increased interest taken in the production of pigs in this district, and to a few of the farmers most interested the future looks fairly bright, but we are so far from a co-operative bacon factory that we think we could do better with a small co-operative bacon factory of our own. The number of pigs sent away from our district last year was more than 1,600, and we think it quite safe in estimating that this year we will market more than 2,000 bacon pigs.

I should be pleased if you could let me know the approximate cost of a small factory complete, capable of treating up to 200 pigs per calendar month; also the gross average profit per pig to 100 lb. weight; also the number of hands required to handle, say, 100 pigs monthly turning them into bacon and smallgoods. I consider the gross profit per pig should be 20s. per 100 lb., which, with twenty-five pigs per week for a start would provide for a working manager to cure bacon and manufacture small goods at, say, £6 per week, two youths as assistants at, say, £4 per week each, which would leave £11 per week for miscellaneous expenses. This to my mind seems a reasonable estimate. A bonus of, say, 2½ per cent. on net annual profit could be paid to manager as an impetus to him to do his best. I simply mention this to give you an idea of our way of looking at this proposition. However, we are imbued with only one idea, and that is to do something to improve our position in life and the prospects of our children who are to follow on. To me it seems that the Western markets should consume all the output from this factory, and we should get all the pigs available in the district over which we would work, and the bacon and smallgoods business within that area should be ours under ordinary conditions, as the retailers could secure fresh supplies more quickly and also save considerably by way of railway freights, also, the producers would save freight on their pigs of, perhaps, 2s. per head. Our idea then is to start with a very small factory, and of course increase its size and capacity as business warrants. My idea is that smallgoods like pork sausages, &c., should be the speciality, and with trains regularly running in all directions through our district we could deliver the goods quickly and regularly in the freshest condition.

We have an idea of running the bacon factory in conjunction with the butter factory which is on co-operative lines. The butter-milk from this factory could be utilised by the bacon factory to fatten store pigs so as to provide themselves with a few fats to fall back on at times when perhaps the supply from the farmers would be low for a week or two, as is only to be expected from time to time.

The answer supplied to our correspondent it will be noted is one of strict caution, for small bacon factories have not been a success (except in exceptional circumstances) in any part of Australia. To sum up the position, it is all a matter of capital. In the words of the manager of one of our largest bacon factories: given sufficient capital to finance the erection of the factory, to pay for the pigs received without

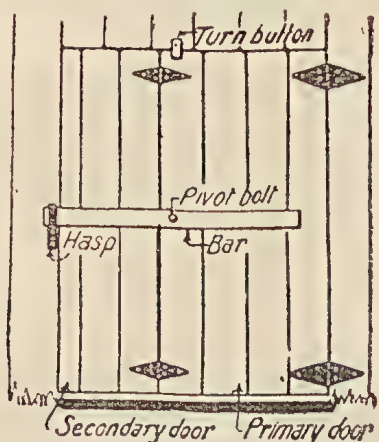
having to keep suppliers waiting until the pigs have been killed and are in process of curing or have been sold, and to provide a sinking fund for lean years and for extension of operations as required; and above all, and this is in reality the crux of the whole question, given the loyal co-operation through good days and bad of the whole of the suppliers and of their earnest endeavours to breed sufficient pigs continuously to keep the factory fully occupied, and to assist at least in consuming and in finding further markets for its products; well, given all these favourable conditions the case bears a different complexion, but can these conditions be guaranteed? Following is the gist of the answer supplied by the Instructor in Pig Raising, Mr. E. J. Shelton:—

It would be better to discuss this matter with the inquirer personally in preference to writing a long letter on the subject. Small bacon factories do not appear to have been a success in any part of Australia. This is largely because the competition is so keen that, unless sufficient capital is available to warrant starting in a fairly large way, the companies at present in operation are able to pay higher prices than the small factory for the first few months, and it would be during this period that the fate of the small concern would be determined. Quite recently on the Atherton Tableland the same question cropped up, and after the directors of the factory there finally decided to instal a comparatively small plant, and after the official opening had actually taken place, they realised that they were up against a very hard proposition, but owing to the operation of the Pig Pool they have been able to control supplies, and this has enabled them already to consider increasing the capacity of their factory to bring it more into line with the other factories operating in the State.

One would rather be inclined to suggest that every other means be exhausted before finally considering the erection of the factory, and to this end getting in touch with the various bacon factories operating in the State at present is suggested with the object of ascertaining if there is any other way of overcoming the present difficulty and thus avoid the necessity of incurring extra expenditure in buildings. All our factories are working at a disadvantage owing to the comparative shortage of supplies, and if a district is in a position to muster sufficient pigs to warrant buyers regularly calling, it is certain that the existing factories would gladly co-operate in relieving the strain. At any rate, it would not pay to consider the erection of a factory to treat 200 pigs per month or less. If the number were 2,000 it would be an entirely different proposition. The inquirer is strongly recommended to give serious consideration to the proposal before moving any further.

DOUBLE-WIDTH DOOR.

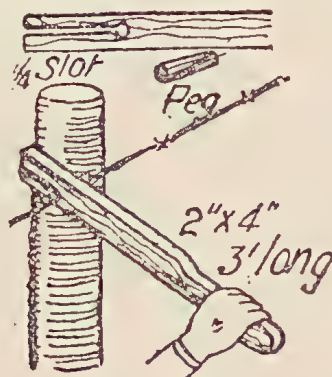
A wide door and a narrow one in the same wide opening, swinging in one direction, strongly barred and securely latched, are built as shown in the illustration taken from "Country Gentleman." The auxiliary button at the top may be



added to hold the primary door in closed position when it is not desired to open it. The hinges mounting the secondary door are spaced far apart, and the bar is of such a length and so positioned that hinges and bar will not interfere with each other in action. The long bar gives strength to the construction.

HOMEMADE BARBED-WIRE STRETCHER.

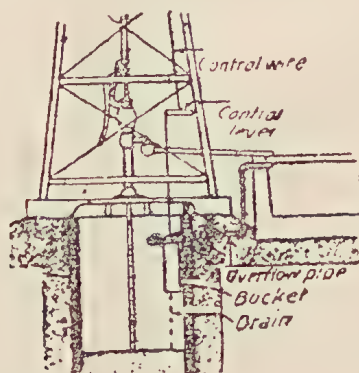
After trying various kinds of barbed-wire stretchers, none of which proved satisfactory, the stretcher shown in the illustration, which is from "Popular Mechanics," was constructed, and gave excellent results. It was made from a piece of 2 in. by 4 in. material, about 3 ft. long. One end was slightly rounded to serve as a handle, and a $\frac{5}{8}$ in. hole was drilled about 4 in. from the other end. A $\frac{1}{4}$ in. slot was then cut from the end to this hole to slip over the wire. After



the wire is located in the hole, as shown, a round tapered wooden peg is pushed in to keep it there. Then, using the post as a fulcrum, the wire is pulled tight by drawing the stretcher up against one of the barbs. The peg should project far enough on each side of the hole, so that it can readily be driven in or out with a slight tap of the hammer.

WINDMILL REGULATOR.

Many devices have been applied to windmill-driven pumps supplying water to tanks to regulate automatically the operation of the windmill as the water in the tank becomes too high or too low. Most of these arrangements are operated by a float or other device in the tank, and are easily rendered inoperative if the float leaks or the mechanism rusts.



The arrangement shown in the accompanying sketch suffers from none of the shortcomings of floats. A 5-gallon cream can is suspended in the well from the end of the control lever by means of a strong wire. A small hole in the bottom of the bucket allows the water to drip out, so that it is emptied about every three hours. As the weight is released, the pump clutch is automatically thrown in, and water is pumped into the tank until it reaches the level of the overflow pipe, which drains into the bucket; as the bucket is filled with water the pump is automatically disengaged, so that the container is prevented from overflowing.—"Farmers' Advocate," South Africa.

Farm and Garden Notes for January.

FIELD.—The main business of the field during this month will be ploughing and preparing the land for the potato and other future crops, and keeping all growing crops clean. Great care must be exercised in the selection of seed potatoes to ensure their not being affected by the Irish blight. Never allow weeds to seed. This may be unavoidable in the event of long-continued heavy rains, but every effort should be made to prevent the weeds coming to maturity. A little maize may still be sown for a late crop. Sow sorghum, imphee, Cape barley, vetches, panicum, teosinte, rye, and cowpeas. In some very early localities potatoes may be sown, but there is considerable risk in sowing during this month, and it may be looked upon merely as an experiment. Plant potatoes whole. Early-sown cotton will be in bloom.

As the regular wet season is expected to commence this month, provision should be made accordingly.

On coastal and intercoastal scrub districts, where recently burnt-off scrub lands are ready for the reception of seed of summer-growing grasses, sowing may commence as soon as suitable weather is experienced. Much disappointment may be saved, and subsequent expenditure obviated, by ensuring that only good germinable grass seed is sown, of kinds and in quantities to suit local conditions, the circumstance being kept in mind that a good stand of grass is the principal factor in keeping down weeds and undergrowth.

In all districts where wheat, barley, oats, canary seed, and similar crops have recently been harvested, the practice of breaking up the surface soil on the cropped areas should invariably be adopted. Soil put into fit condition in this way will "trap" moisture and admit of the rains percolating into the subsoil, where the moisture necessary for the production of a succeeding crop can be held, provided attention is given to the maintenance of a surface mulch, and to the removal, by regular cultivation, of volunteer growths of all kinds. If not already seen to, all harvesting machinery should be put under cover, overhauled, and the woodwork painted where required.

Where maize and all summer-growing "hoed" crops are not too far advanced for the purpose, they should be kept in a well-cultivated condition with the horse hoe. Young maize and sorghum crops will derive much benefit by harrowing them, in the same direction as the rows are running, using light lever harrows with the tynes set back at an angle to obviate dragging out of plants, but the work should not be done in the heat of the day.

Quick-maturing varieties of maize and sorghum may still be sown in the early part of the month in coastal areas where early frosts are not expected.

Succession sowings may be made of a number of quick-growing summer fodder crops—Sudan grass, Japanese and French millet, white panicum, and liberty millet (panicum). In favourable situations, both "grain" and "saccharine" sorghums may still be sown; also maize, for fodder purposes.

Fodder conservation should be the aim of everyone who derives a living from stock, particularly the dairyman; the present is an important period to plan cropping arrangements. Exclusive of the main crops for feeding-off (when fodder is suitable for this purpose), ample provision should be made for ensilage crops to be conserved in silo or stack. As natural and summer-growing artificial grasses may be expected to lose some of their succulence in autumn, and more of it in winter and early spring, the cropping "lay-out" to provide a continuity of succulent green fodder throughout the season calls for thorough and deep cultivation and the building up of the fertility and moisture-holding capacity of the soil. Planter's friend (sorghum) may be sown as a broadcast crop at the latter end of the month for cutting and feeding to cattle in the autumn and early winter. Strips of land should be prepared also for a succession sowing about the second week in February, and for winter-growing fodder crops.

KITCHEN GARDEN.—A first sowing of cabbages, cauliflower, and Brussels sprouts may now be made in a covered seed bed, which must be well watered and carefully protected from insect pests. Sow in narrow shallow drills; they will thus grow more sturdy, and will be easier to transplant than if they were sown broadcast. The main points to be attended to in this early sowing are shading and watering. Give the beds a good soaking every evening. Mulching and a slight dressing of salt will be found of great benefit. Mulch may consist of stable litter, straw, grass, or dead leaves. Dig over all unoccupied land, and turn under all green refuse, as

this forms a valuable manure. Turn over the heavy land, breaking the lumps roughly to improve the texture of the soil by exposure to the sun, wind, and rain. In favourable weather, sow French beans, cress, cauliflower, mustard, cabbage, celery, radish for autumn and winter use. Sow celery in shallow well-drained boxes or in small beds, which must be shaded till the plants are well up. Parsley may be sown in the same manner. Turnips, carrots, peas, and endive may also be sown, as well as a few cucumber and melon seeds for a late crop. The latter are, however, unlikely to succeed except in very favourable situations. Transplant any cabbages or cauliflowers which may be ready. We do not, however, advise such early planting of these vegetables, because the fly is most troublesome in February. For preference, we should defer sowing until March. Still, as "the early bird catches the worm," it is advisable to try and be first in the field with all vegetables, as prices then rule high. Cucumbers, melons, and marrows will be in full bearing, and all fruit as it ripens should be gathered, whether wanted or not, as the productiveness of the vines is decreased by the ripe fruit being left on them. Gather herbs for drying; also garlic, onions, and eschalots as the tops die down.

FLOWER GARDEN.—To make the flower-beds gay and attractive during the autumn and winter months is not a matter of great difficulty. Prepare a few shallow boxes. Make a compost, a great part of which should consist of rotten leaves. Fill the boxes with the compost; then sow thinly the seeds of annuals. Keep the surface of the soil moist, and when the young seedlings are large enough to handle, lift them gently one by one with a knife or a zinc label—*never pull them up by hand*, as, by so doing, the tender rootlets are broken, and little soil will adhere to the roots. Then prick them out into beds or boxes of very light soil containing plenty of leaf mould. Keep a sharp lookout for slugs and caterpillars.

All kinds of shrubby plants may be propagated by cuttings. Thus, pelargoniums, erotons, coleus, and many kinds of tropical foliage plants can be obtained from cuttings made this month. After putting out cuttings in a propagating frame, shade them with a piece of calico stretched over it. Be careful not to over-water at this season. Propagate verbenas, not forgetting to include the large scarlet Fox-hunter. Verbenas require rich soil. Palms may be planted out this month. If the weather prove dry, shade all trees planted out. With seed-boxes, mulch, shade, water, and kerosene spray, all of which imply a certain amount of morning and evening work, the flower garden in autumn and winter will present a charming sight.

Orchard Notes for January.

THE COASTAL DISTRICTS.

All orchards, plantations, and vineyards should be kept well cultivated and free from weed growth; in the first place, to conserve the moisture in the soil, so necessary for the proper development of all fruit trees and vines; and, secondly, to have any weed growth well in hand before the regular wet season commences. This advice is especially applicable to citrus orchards, which frequently suffer from lack of moisture at this period of the year if the weather is at all dry, and the young crop of fruit on the trees is injured to a greater or less extent in consequence.

Pineapple plantations must also be kept well worked and free from weeds, as when the harvesting of the main summer crop takes place later on, there is little time to devote to cultivation. If this important work has been neglected, not only does the actual crop of fruit on the plants suffer, but the plants themselves receive a setback.

Banana plantations should be kept well worked, and where the soil is likely to wash badly, or there is a deficiency of humus, a green crop for manuring may be planted. Should the normal wet season set in, it will then soon cover the ground without injury to the banana plants. When necessary, banana plantations should be manured now, using a complete manure rich in potash and nitrogen. Pineapples may also be manured, using a composition rich in potash and nitrogen, but containing no acid phosphate (superphosphate) and only a small percentage of bone meal, ground phosphatic rock, or other material containing phosphoric acid in a slowly available form.

Bananas and pineapples may still be planted, though it is somewhat late for the former in the more southern parts of the State. Keep a good lookout for pests of all kinds, such as Maori on citrus trees, scale insects of all kinds, all leaf-eating insects, borers, and fungus pests generally, using the remedies recommended in Departmental publications.

Fruit fly should receive special attention, and on no account should infested fruit of any kind be allowed to lie about on the ground to become the means of breeding this serious pest. If this is neglected, when the main mango crop in the South and the early ripening citrus fruits are ready, there will be an army of flies waiting to destroy them.

Be very careful in the handling and marketing of all kinds of fruit, as it soon spoils in hot weather, even when given the most careful treatment. Further, as during January there is generally more or less of a glut of fresh fruit, only the best will meet with a ready sale at a satisfactory price.

Grapes are in full season, both in the Brisbane and Coominya districts, and in order that they may be sold to advantage they must be very carefully handled, graded, and packed, as their value depends very much on the condition in which they reach the market and open up for sale. Well-coloured fruit, with the bloom on and without a blemish, always sells well, whereas badly coloured, immature, or bruised fruit is hard to quit.

One of the greatest mistakes in marketing grapes is to send the fruit to market before it is properly ripe, and there is no better way to spoil its sale than to try and force it on the general public when it is sour and unfit to eat.

Bananas for sending to the Southern States require to be cut on the green side, but not when they are so immature as to be only partially filled. The fruit must be well filled but show no sign of ripening; it must be carefully graded and packed and the cases marked in accordance with the regulations under the Fruit Cases Acts and forwarded to its destination with as little delay as possible.

Pineapples should be packed when they are fully developed, which means that they contain sufficient sugar to enable the fruit to mature properly. Immature fruit must not be marketed, and if an attempt is made to do so the fruit is liable to seizure and the sender of the fruit to prosecution under the abovenamed regulations. Further, the fruit must be graded to size and the number of fruit contained in a case must be marked thereon. Immature fruit must not be sent. For canning, the fruit should be partly coloured; immature fruit is useless; and overripe fruit is just as bad. The former is deficient in colour and flavour and the latter is "winey" and of poor texture, so that it will not stand the necessary preparation and cooking.

Should there be a glut of bananas, growers are advised to try and convert any thoroughly ripe fruit into banana figs.

The fruit must be thoroughly ripe, so that it will peel easily, and it should be laid in a single layer on wooden trays and placed in the sun to dry. If the weather is settled, there is little trouble, but if there is any sign of rain the trays must be stacked till the weather is again fine, and the top of the stack protected from the rain. To facilitate drying, the fruit may be cut in half lengthways. It should be dried till a small portion rubbed between the finger and thumb shows no sign of moisture. It can be placed in a suitable box to sweat for a few days, after which it can be dipped in boiling water to destroy any moth or insect eggs that may have been laid on it during the process of drying and sweating. It is then placed in the sun to dry off any moisture, and when quite dry it should be at once packed into tight boxes lined with clean white paper. It must be firmly packed, when, if it has been properly dried, it will keep a considerable time. It can be used in many ways, and forms an excellent substitute for raisins, sultanas, currants, or other dried fruits used in making fruit cakes and other comestibles. Banana figs will be found useful for home consumption, and it is possible that a trade may be built up that will absorb a quantity of fruit that would otherwise go to waste.

GRANITE BELT, SOUTHERN AND CENTRAL TABLELANDS.

January is a busy month in the Granite Belt, and orchardists are fully occupied gathering, packing, and marketing the crop of midseason fruits, consisting of plums of several kinds, peaches, nectarines, pears, and apples. The majority of these fruits are better keepers and carriers than those that ripen earlier in the season; at the same time, the period of usefulness of any particular fruit is very limited, and it must be marketed and disposed of with as little delay as possible.

The advice given in the Notes for December, to send nothing but first-class fruit to market, still holds good. With the great increase in production, owing to the large area of new orchards coming into bearing and the increasing yields of those orchards that have not come into full profit, there is not likely to be any market for immature or inferior fruit. There will be ample good fruit to fully supply the markets that are available and accessible. Much of the fruit will not carry much beyond the metropolitan market, but firm-fleshed plums, clingstone peaches, and good, firm apples should stand the journey to the Central, and, if they are very carefully selected, handled in a manner to prevent any bruising, and properly graded and packed, they should carry as far as Townsville. Growers must remember that, given a market fully supplied with fruit, only such fruit as reaches that market in first-class condition is likely to bring a price that will pay them; consequently the grower who takes the trouble to send nothing but perfect fruit, to grade it for size and colour, to pack it carefully and honestly, placing only one sized fruit, of even quantity and even colour, in a case, and packing it so that it will carry without bruising, and, when opened up for sale, will show off to the best advantage, is pretty certain of making good. On the other hand, the careless grower who sends inferior, badly graded, or badly packed fruit is very likely to find, when the returns for the sale of his fruit are to hand, that after paying expenses there is little, if anything left. The expense of marketing the fruit is practically the same in both cases.

Then "why spoil the ship for the ha'p'orth of tar" after you have gone to the expense of pruning, spraying, manuring, and cultivating your orchard? Why not try and get a maximum return for your labour by marketing your fruit properly? The packing of all kinds of fruit is a fairly simple matter, provided you will remember—

- (1) That the fruit must be fully developed, but yet quite firm when gathered.
- (2) That it must be handled like eggs, as a bruised fruit is a spoilt fruit, and, when packed with sound fruit, spoils them also.
- (3) That only one-sized fruit, of an even degree of ripeness and colour, must be packed in a case.
- (4) That the fruit must be so packed that it will not shift, for if it is loosely packed it will be so bruised when it reaches its destination that it will be of little value. At the same time, it must not be packed so tightly as to crush the fruit.

If these simple rules are borne in mind, growers will find that much of the blame they frequently attribute to the fruit merchants or middlemen is actually the result of their own lack of care. Fruit that opens up in the pink of condition sells itself, whereas any fruit that opens up indifferently is hard to sell on any except a bare market, and on a glutted market is either unsaleable or realises such a poor price that the grower is frequently out of pocket and would have been better off had he not attempted to market it.

If spraying with arsenate of lead, and systematic bandaging, has been properly carried out, there will be comparatively few codlin moths to destroy the later ripening pip fruits; but if these essential operations have been neglected or carelessly carried out, a number of moths will hatch out and the eggs laid by them will turn to larvæ that will do much damage, in some cases even more than that caused by the first broods that attack the fruit as soon as it is formed. Where there is any likelihood, therefore, of a late crop of moths, spraying with arsenate of lead must be continued if the late crop of pip fruits is to be kept free from this serious pest.

Fruit fly must be systematically fought, and on no account must any fly-infected fruit be allowed to lie about on the ground and breed this pest, to do further damage to the later ripening fruits.

Citrus orchards will need to be kept well cultivated in the drier and warmer parts of the State, and, where necessary, the trees should be irrigated. If scale insects are present, the trees should be either sprayed, or, better still, treated with hydrocyanic acid gas.

Western grapes are in full season, and if they are to be sent long distances by rail, then they are all the better to be cut some hours before they are packed, as this tends to wilt the stems and keep the berries from falling off in transit. The fruit must be perfectly dry when packed, and should be as cool as possible. It must be firmly packed, as a slack-packed case always carries badly and the fruit opens up in a more or less bruised condition.

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